

This appendix provides detail from master plans and other management documents for each of the 13 Willamette Basin projects operated by the U.S. Army Corps of Engineers (USACE). The level of detail provided below varies between projects, reflecting the status and level of detail in the base documents. Due to the size and complexity of some projects, the information provided is limited to that with ramifications or consequences to vegetation and wildlife resources.

## 1. DETROIT AND BIG CLIFF

Neither Detroit nor the Big Cliff projects have in place a current, valid master plan and a current land use plan. However, resource management information is provided in early USACE documents. This overview of USACE lands at the Detroit and Big Cliff projects on the North Santiam River is based upon detailed information provided in: *Master Plan for Resource, Mid-Willamette Valley Projects/Foster - Green Peter - Big Cliff, Part I - Resource Use Objectives* (USACE 1981a); and *Master Plan for Resource, Mid-Willamette Valley Projects/Foster - Green Peter - Big Cliff, Appendix I - Technical Data* (USACE 1981b).

### 1.1 OVERVIEW OF PROJECT LANDS

Detroit Lake is located approximately 48 miles southeast of Salem. In the area of the Detroit and Big Cliff Dams, the North Santiam Canyon is narrow, rocky, and steep. At maximum conservation pool, the pool has approximately 3,600 acres. USACE project lands at Detroit Lake are limited to the dam and associated operations facilities; the USACE maintains no project lands other than those that directly support the facilities and operations. Most lands adjacent to Detroit Lake are managed and operated by the U.S. Forest Service (USFS), Willamette National Forest. Recreation at Detroit Lake includes two parks operated by the Oregon Parks and Recreation Department (OPRD). Mongold is a day-use area, while the Detroit Lake State Park has campsites and RV camps. The USFS operates three campgrounds: Piety Boat Camp, Hoover campground, and South Shore campground. Private moorage facilities are available in the town of Detroit.

Big Cliff Lake is located in a narrow, rocky gorge of the North Santiam River, approximately 3 miles downstream of the Detroit Dam. Development is constrained by steep shoreline slopes and absence of places where recreational facilities could be provided. Furthermore, daily fluctuations of water levels in Big Cliff Lake can reach as much as 24 feet. This fluctuation, coupled with the small amount of available land and the relatively small size of the lake (136 acres at maximum conservation pool), limits development potential for recreation. As a consequence of the limited project lands at the Detroit and Big Cliff projects, the USACE does not maintain current master plans, resource objectives, and land use plans for either project. Big

Cliff is the least developed of the 13 Willamette Valley projects, having only an unimproved boat launch ramp. The surface area of Big Cliff Lake is 136 acres.

## **1.2 PROJECT WIDE RESOURCE OBJECTIVES**

Most lands adjacent to the Detroit and Big Cliff projects are federal or private forest lands. Because Detroit Lake lies within the Willamette National Forest and the USACE maintains no project lands other than those that directly support the facilities and operations, no project wide resource objectives are recognized at Detroit Lake. There are also no project wide resource objectives for Big Cliff. However, resource objective are identified for each of five geographic areas, and reflect vegetation (Plate B-1) and the site inventory (Plate B-2) of the project lands.

## **1.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS**

An early master plan for the Big Cliff, Foster, and Green Peter projects (USACE 1981a and 1981b) identified land use allocation classifications for 517 acres of project lands at Detroit and Big Cliff (Plate B-3). These include project operations (152 acres), reserve forest land (170 acres), and wildlife management (59 acres). The remaining land is open water (136 acres) at Big Cliff. The USACE project lands are also divided into 5 discrete geographic areas. Resource objectives were identified that are specific to each of these areas.

**Area A** includes the Detroit Dam and Powerhouse, Big Cliff Dam and Powerhouse, and abutments, operational buildings, storage areas, access road, and other facilities required for operation of both projects. Area A totals 142 acres and is classified for Project Operations. The identified resource use objective for Area A is to “maintain lands to support project structures and allow for continued safe and efficient operations of Big Cliff and Detroit projects for authorized project purposes.”

**Area B**, approximately 10 acres, includes most of the USACE administered land along the north shore of Big Cliff Lake from Detroit Dam downstream to the western boundary of Big Cliff Dam (excluding Area A). This area includes narrow strips of disturbed lands divided by Highway 22, which skirts along the north shoreline of Big Cliff Lake for most of its length. Most of the land is steep and consists mainly of revetments and highway fill. Area B is classified for Project Operations.

**Area C** occupies 170 acres of steeply sloping land on the south side of Big Cliff Lake. Most of the area has been logged and burned in the past and is now covered with second-growth deciduous and coniferous trees. Area C is classified as Reserve Forest Land with a resource use objective to “preserve existing forest resources for continued erosion control and enhancement of visual quality.”

**Area D** is a 59 acre site on the south side of Big Cliff Lake, approximately 0.25 mile downstream from the left abutment of Detroit Dam. The area is a relatively flat bench above the steep canyon slope and is covered with a thick stand of young deciduous trees. The objective of this unit, which is classified for Wildlife Management, is to “establish and maintain winter browse habitat for deer and elk.

**Area E** consists of all the approximately 136 acres of water surface in Big Cliff Lake. This area is designated as a No-Wake Boat Zone, where boating is restricted to small non-motorized or small engine displacement (4 horsepower or smaller) boats only.

#### **1.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN**

The only listed, proposed, and candidate threatened or endangered wildlife and plant species and species of concern documented at or in close proximity to Big Cliff and Detroit Lakes is bald eagle (*Haliaeetus leucocephalus*). Northern spotted owl (*Strix occidentalis*) and Canada lynx (*Lynx canadensis*) may occur in the broader resource area surrounding these projects.

## **2. GREEN PETER AND FOSTER**

Neither the Green Peter nor Foster projects have current, valid master plans and current land use plans. However, early resource objectives were identified for each. This summary of project lands for Green Peter and Foster Lakes on the Middle and South Santiam Rivers is based upon detailed information provided in the following documents: *Master Plan for Resource, Mid-Willamette Valley Projects/Foster - Green Peter - Big Cliff, Part I - Resource Use Objectives* (USACE 1981a); *Master Plan for Resource, Mid-Willamette Valley Projects/Foster - Green Peter- Big Cliff, Appendix I - Technical Data* (USACE 1981b); *Master Plan for Resource, Mid-Willamette Valley Projects/Green Peter Lake, Part II Plan of Development* (USACE 1987); and *Foster Lake Master Plan Design Memorandum No. 14* (USACE 1976).

### **2.1 OVERVIEW OF PROJECT LANDS**

Foster Lake is located at the confluence of the Middle and South Santiam Rivers in Linn County near the town of Foster. At maximum conservation pool, the irregularly shaped pool has approximately 1,195 acres. About 884 acres of project lands are located above the pool, with 258 of these used for managed recreational areas. The remaining 626 acres are used for general project access, easements, other allocations, and project operations functions.

Green Peter Lake is located immediately upstream from Foster Lake on the Middle Santiam River. It is three times as large as Foster Lake, with approximately 3,605 acres of water surface. About 2,700 acres of project land is located above the maximum conservation pool level, but only 332 of these are used for recreation. The remaining project lands are steep, narrow strips that have value as buffer areas and wildlife habitat.

Opportunities for fishing, boating, water skiing, camping, and picnicking are available at Green Peter and Foster Lakes, with approximately 1,166,400 recreation visits made in 1996.

Recreation at Green Peter Lake includes Whitcomb Creek Park and Thistle Creek boat ramp. These are administered by Linn County Parks and Recreation Commission. Public recreation at Foster Lake includes Sunnyside Park, Lewis Creek Park, and Gedney Creek Boat Ramp. These are also administered by the Linn County Parks and Recreation Commission. Foster Lake parks operated by the USACE are Andrew S. Wiley Park and Shea Point.

Five basic vegetative cover types are identified at the projects (Plate B-4 and Plate B-5). These are open natural area, disturbed area, deciduous forest, mixed deciduous/coniferous forest, second growth coniferous forest, and old growth forest. The majority of the coniferous forest of the area is second growth Douglas fir with western hemlock. Logging is the principle industry of the area and old-growth timber areas are rare. The dominant tree in the deciduous forest is red alder. Wetlands and shallow-water ponds are a limited resource at the projects.

Due to the topography of the lakes, there are only three wetland areas in the projects, all within Foster Lake. Each of these sites is in disturbed areas, and although these areas are small, they do provide the necessary habitat for a large group of water and marsh birds. These wetlands and shallow water ponds are located at Lewis Creek and the old fish hatchery site.

Other important habitats at Foster Lake identified as warranting special wildlife management consideration include mineral springs in the Foster Dam Quarry site (potentially important for band-tailed pigeons); mature timber and snags at Neuhaus Point, the South Santiam arm to Menear Bend, and at the Middle Santiam from the Old Fish Hatchery Park to the project boundary receive heavy use by osprey and great blue herons; and timbered area north and south of Bufford Road on Neuhaus Peninsula serves as winter range for deer. The use of Foster Lake project lands by many wildlife species, and the potential for intensive and extensive wildlife management activities is constrained by existing recreational development, urban contact, a small land base, steep terrain, roads along the edge of the reservoir, and large water level fluctuations. However, neighboring lands, particularly those under the jurisdiction of the Bureau of Land Management (BLM), have high wildlife values.

At Green Peter, existing recreational development and a small land base generally limit the potential for intensive wildlife management activities. However, several sites have been identified as possessing capability to support limited wildlife management programs. The upper arm of the Middle Santiam River provides range for deer and elk. Other limited opportunities exist to sustain and possibly improve existing habitats and minimal wildlife populations by exercising wildlife management practices in association with other resource uses and management actions. Important habitats identified at Green Peter Lake as warranting special wildlife management consideration include project lands north and south of Green Peter Dam (band-tailed pigeons, grouse, quail, and deer); Tally Creek Park (band-tailed pigeon and elk); drawdown areas on the north and south sides of the Middle Santiam arm of the project (winter range for elk); mature timber and snags in the Middle Santiam arm (osprey and bald eagle); and mature timber and snags at Whitcomb Creek Park (pileated woodpecker).

Wildlife species found at Green Peter Lake are typical of those found in second-growth coniferous and coniferous/hardwood forests of the western Cascades. Use of project lands by many wildlife species is restricted, however, by steep terrain, roads along the edge of the reservoir, and large water level fluctuations. The lake and adjacent lands provide favorable habitat for bald eagle and osprey. Neighboring lands, particularly those under the jurisdiction of the BLM, have high wildlife values. Roosevelt elk and black-tailed deer are present on project lands, elk found in the project vicinity primarily in winter. A moderate number of year-around resident black-tailed deer are year-around residents at Green Peter Lake, particularly downstream of the dam. The suitability of USACE land for big game is limited by disturbance from logging traffic, reservoir drawdown, recreation activity, steep terrain, limited thermal cover, and small, narrow, habitat units. Most of the suitable habitat on USACE managed land is along the Quartzville Creek and Middle Santiam Arms of Green Peter Lake and downstream of the dam. Ruffed grouse and band-tailed pigeons are the most significant upland game birds found on the Green Peter Lake Project. Waterfowl use is primarily by common mergansers, mallards, and wood ducks, with the most favorable waterfowl habitat present on the Quartzville and Middle Santiam Arms of the lake. Numerous nongame species occur on project lands, although species diversity is relatively low because of limited available habitat. Of greatest significance are raptors such as bald eagle, osprey, and northern spotted owl. Nongame birds consist primarily of species typically found in second-growth coniferous forests. These include black-capped chickadee, Steller's jay, hairy woodpecker, northern flicker, winter wren, golden-crowned kinglets, and varied thrush. Bald eagles are present year-around at Green Peter Lake. Northern spotted owl activity centers are known on adjacent BLM land. Other nongame species in the project area includes deer mouse, raccoon, northern flying squirrel, and Douglas squirrel.

## 2.2 PROJECT WIDE RESOURCE OBJECTIVES

The only identified Project Wide Objectives for the Foster and Green Projects is to “retain and enhance the recreation values of the project while protecting and preserving the projects natural characteristics. However, Resource Objective are identified for each of five geographic areas, and reflect vegetation (Plates B-4 and B5) and the site inventory (Plates B-6 and B-7) of the project lands

## 2.3 LAND USE ALLOCATIONS AND MANAGEMENT UNITS

Land use allocations for the Green Peter and Foster projects include project operations, wildlife management, low-density recreation, intensive-use recreation, reserve forest land, and natural areas. The project lands at Green Peter are delineated into 18 management units. Table B-1 identifies the breakdown of these land use classifications within these units, and each of the management units is described below and illustrated in Plate B-8.

Table B-1 Green Peter Dam land use allocation classifications by management unit.

Management Unit	Land Use Classification (acres)					
	Project Operations	Natural Area	Recreation	Wildlife Mgmt	Water	Total Area
	Operations		Intensive Use	Low Density		
A. Green Peter Dam	29					29
B. Natural Area		1,312				188
C. Boat-In Recreation Sites Rumbaugh Cr, Quartzville, Fools Canyon, Homestead, Trout Cr, Tally Cr				100		100
D. Thistle Creek Access			9			9
E. Whitcomb Creek Park			319			319
F. Billings Park			4			4
G. Dam Abutments					637	637
H. Upper Middle Santiam Arm (Elk Flat)					39	39
I. Project General (Moose Creek Unit)					29	29
J. Green Peter Lake					3,605	3,605
K. Rocky Top/Whitcomb Island Area	222				32	252
<b>Total</b>	<b>251</b>	<b>1,312</b>	<b>332</b>	<b>100</b>	<b>737</b>	<b>5,211</b>

**Management Unit A (Green Peter Dam)** is a 29-acre parcel of lands supporting project operational facilities, including the dam site, spillway, powerhouse, right abutment viewpoint, and material storage areas. The identified development and management concepts for Unit A

include to establish and maintain an artificial mineral sites for band-tailed pigeons to replace site lost due to impoundment.

**Management Unit B (Natural Area)** totals 1,312 acres found in narrow strips located between the lake and adjacent roads or the project boundary. Due to their narrow configuration, these lands offer limited development opportunities, however, they buffer adjacent land uses, help maintain undisturbed shoreline edge, and enhance visual resource values. The Resource Use Objective of this unit is “to preserve and enhance the visual quality of the project.” The development and management concepts include to improve those areas disturbed during project construction through application of fertilizers, hydro-mulching, grass or wildflower seeding, and/or planting of indigenous tree species; to promote diversity of wildlife species in suitable areas compatible with visual quality; and to manage shoreline vegetation to provide perching and nesting sites for raptors.

**Management Unit C (Boat-In Recreation Sites)** occupies a total of 100 acres comprised of six sub-units that receive substantial boat-in use for camping, picnicking, and sightseeing. The sub-units include Rumbaugh Creek on the left bank of the lake, approximately 4 miles upstream of the dam. This 50-acre sub-unit consists of a narrow peninsula with a generally steep shoreline and mixed second-growth tree stands. The Rumbaugh Creek sub-unit includes important winter forage for elk and deer. In addition, shoreline vegetation provides important perching and nesting raptors. An identified resource use objectives habitat for this sub-unit is it “will be managed for secondary emphasis of wildlife (elk and deer forage) and raptor (shoreline vegetation) habitat. Other sub-units of Management Units C are identified as Quartzville, Fools Canyon, Homestead, Trout Creek, and Tally Creek sub-units, located on both the Quartzville and Middle Santiam arms of the lake. Quartzville and Fools Canyon receive heavy use by water skiers, while the Homestead sub-unit has limited access at lower pool elevations. The Quartzville sub-unit is near an active bald eagle nest site on adjacent BLM land. The identified Resource Use Objective of the Rumbaugh Creek sub-unit is to “be managed for a secondary emphasis of wildlife (elk and deer forage) and raptor (shoreline vegetation) habitat.” For the Quartzville sub-unit is identified Resource Use Objective is the “site will be monitored for potential bald eagle habitat impacts, site resource damage, and sanitation.” The Fools Canyon and Homestead sub-units “will be managed to allow present primitive boat-in recreation use to continue without resource damage to the sites or unhealthful sanitation conditions.”

**Management Unit D (Thistle Creek Access)** is a 9-acre intensive recreation site managed by Linn County. This unit is used primarily for boat launching, although considerable shoreline fishing occurs as well. Facilities are limited to the boat-launch ramp, a parking lot, and two vault restrooms. The identified Resource Use Objective of Thistle Creek Access is to “continue management by Linn County of the unit for boat launching and shoreline access opportunities.”

**Management Unit E (Whitcomb Creek Park)** is a major high-intensive recreational area operated by Linn County, occupying 319 acres. It is the largest and most highly developed

recreational area at Green Peter. The park consists of two areas. The downstream area contains the major recreation facilities for camping, day use, and boat launching. The upstream portion consists of a small day-use area accessible by boat or trail. Boat launching and camping are the park's primary attraction. Development and Management Concepts identified for the Whitcomb Creek Park Unit include to "in cooperation with Linn County Parks Department, initiate a passive shoreline wildlife habitat management for raptor and other nongame wildlife."

**Management Unit F (Billings Park)** is a 4-acre intensive recreation site at the dam's left abutment. This unit consists of a parking area and chemical toilet. Primary use of the park is for sightseeing, shoreline fishing, and boat launching (unimproved launch area).

**Management Unit G (Downstream Area/Dam Abutments)** is a 637-acre site adjacent to the dam abutments downstream of the dam, designated for wildlife management. Construction of the dam substantially altered much of this area, but a succession of vegetation has occurred with Red alder now the predominant species. Public use of this area is minimal, but damage by off-road vehicles (ORVs) has occurred resulting in a vegetation disturbance, soil erosion, and loss of forage. The Development and Management Concepts of this unit include to "passively maintain the area to permit normal seral development of vegetation communities," "protect riparian areas and mature growth in riparian sites to maintain present band-tailed pigeon and bald eagle use," "designate and maintain specific areas for deer forage," and "monitor use of these and adjacent lands by wintering bald eagles."

**Management Unit H (Elk Flat)** is a 39-acre site along the upper Middle Santiam arm managed for wildlife. This unit is made up of narrow strips of land located along both shorelines when the lake is at maximum conservation pool. The area is used by elk as winter range, and is a very popular undeveloped camping area during summer. Shoreline vegetation consists of coniferous and deciduous-coniferous forest. Management activities have included experimental seeding and fertilization for elk forage in the perimeter drawdown zone, an area of approximately 244 acres, which is not classified land in this unit. Scattered stands of Columbia sedge have been established in the drawdown zone to provide forage for wintering elk. Land adjacent to the project provides habitat for black-tailed deer and elk. Bald eagles and ospreys forage in the area at full pool. Some limited waterfowl habitat is present. This forested unit also provides habitat for a variety of nongame species. The Development and Management Concepts for the Elk Flat Unit include to "develop a winter range management program for elk in coordination with ODFW to provide 400-1,000 elk use-days annually... through planting of Columbia sedge and willows, and seeding of grass in the drawdown zone," "monitor elk use of site and modify program as necessary," "provide bird boxes for cavity-nesting songbirds," "monitor activities, particularly ORV use, on elk winter range site. Take measures necessary to limit or shift use to another area if damage is significant."

**Management Unit I (Moose Creek)** is a 29-acre parcel of land on the Quartzville arm that is managed primarily for wildlife. It consists of steep terrain surrounding a 3-acre embayment at

the mouth of Moose Creek. This embayment, although subject to water fluctuations, maintains a significant pool even at periods of full drawdown. A large gravel-surfaced parking area is located between the road and the embayment, and is used for access to the lake and for an undeveloped camp spot by self-contained recreational vehicles. This unit is withdrawn to the Bureau of Land Management, which retains vegetation manipulation responsibility. The upland habitat at Moose Creek is primarily mature coniferous forest, with some shrubby areas around the periphery of the embayment. The embayment is primarily open water, with very little emergent vegetation, and supports populations of waterfowl including common mergansers, hooded mergansers, and wood ducks. Adjacent mature coniferous forest provides valuable habitat for a variety of important nongame wildlife including osprey and bald eagles. Development and Management Concepts for the Moose Creek Unit include to “install, monitor, and maintain nesting boxes around Moose Creek Pond for nesting waterfowl,” “maintain mature coniferous forest to provide deer winter range,” and “plant willow and other emergent plants in the drawdown zone of the embayment to provide habitat diversity for waterfowl and nongame species.”

**Management Unit J (Green Peter Lake)** consists of the entire lake surface, which occupies 3,605 acres at full conservation pool. It does not include those lands exposed during the drawdown period. The annual drawdown is 88 feet. Three use zones are identified. No boat access is permitted in the area around the dam. The upper end of Whitcomb Creek is zoned for a maximum speed of 10 mph. The remainder of the lake has no boating restrictions. No specific Development and Management Concepts are specific to wildlife and vegetation resources.

**Management Unit K (Rocky Top/Whitcomb Island)** totals 252 acres consisting of shoreline along Rocky Top Peninsula, as well as the 2-acre Whitcomb Island in Green Peter Lake. The shoreline is steep, and the forest cover is dominated by mature Douglas fir. This unit is managed primarily for wildlife, and provides the most significant raptor habitat on the project. Several osprey nests are present on the unit, and ospreys use the shoreline vegetation for perching. A bald eagle nest is located on the project boundary, on land administered by the BLM. Spotted owls also nest on adjacent BLM lands. Development Concepts for this unit include “in coordination with BLM and ODFW, protect existing nesting and perching habitat for raptors and create additional nest trees for osprey by constructing platforms or topping green trees along the shoreline,” “monitor osprey and eagle activity,” “develop management plan for bald eagle nest,” and “restrict public use and monitor recreation activity on the unit to assure that activities which are incompatible with nesting raptors are eliminated.”

The Foster Lake Project contains approximately 916 acres of land above maximum conservation pool. Of this, approximately 165 acres are used for recreational access. The remaining lands are used for general project access and project operations functions. The Foster Lake project lands

are divided into 13 individual parcels (sites). These sites are indicated in the Site Inventory for Foster Lake (see Plate B-7).

**Site 1.** Foster Dam is a rock and quarried backfill embankment 4,800 feet long. The dam has two concrete overflows, a fish ladder and holding pond, power generating facilities, and operational offices.

**Site 2.** The ODFW fish hatchery located on the north bank of the Middle Santiam River, immediately downstream of the dam.

**Site 3.** Andrew Wiley Park is approximately 10 acres located immediately downstream from the dam on the south bank of the river. This site is flat and has minimal tree cover. It is used for day-use activities and launching drift boats.

**Site 4.** Lewis Cemetery, is located approximately one-half mile upstream of the dam between the shoreline and North River Road. It is approximately 2 acres in size, but is not within the project boundary. It is maintained by the Sweet Home Cemetery Maintenance District.

**Site 5.** Gedney Creek Access, is a narrow 5 acre site located approximately 1.5 mile from Foster, between North River Road and the lake. It is used primarily for launching boats.

**Site 6.** Lewis Creek Park is a 40-acre site located on the north shore of the lake two miles upstream of the dam. It is characterized by flat terrain and a mixture of open fields and wooded areas. This site is developed for day-use activities, with major emphasis on picnicking and swimming opportunities.

**Site 7.** Sunnyside Park is located one mile from Highway 20 on Quartzville Road. This 70-acre park borders the Middle Santiam River and is surrounded by steeply sloping hills on the north, west, and south. The topography of the site is mainly flat, with the exception of a distinct ridge on the western edge. Trees are found on this ridge and along the western edge of the park. Developed facilities include a boat launch ramp, picnicking sites, and camp units.

**Site 8.** Menear Bend is a 31-acre site located approximately 5 miles east of Foster on the extreme end of the South Santiam Arm of the lake. The downstream end of the site is heavily wooded and gently sloping. The upstream end of the site is an open meadow sloping to the river. This site has only primitive camping facilities.

**Site 9.** Calkins Park is a 7-acre site located 2.25 miles east of Foster at the intersection of Highway 20 and Quartzville Road. The terrain is flat to moderate slopes with mature forest. Site development is limited to minimal picnic facilities and an unimproved boat launching area.

**Site 10.** The South Santiam Scenic Corridor is located upstream from Calkins Park. The area includes a narrow channel, steeply sloping canyon walls, a mixed forest of hardwoods and conifers, small natural openings, and numerous rocky outcrops.

**Site 11.** Shea Point is a 2-acre site located approximately 0.5 mile east of Foster on Highway 20. It is developed as a vehicular turn-around and parking lot, with a central landscaped island and viewing structure overlooking the lake.

**Site 12.** The Old Fish Hatchery includes 7 acres and is located on Quartzville Road approximately 5 miles upstream from Foster. All that remains of the former fish hatchery are small ponds and a water diversion channel. The site is presently used for angler access and is a nesting site for waterfowl.

**Site 13.** Sunnyside School House includes approximately 10 acres and is located 3.5 miles from Foster. It is now used as a vehicle storage area, office space, and as a school house by the Head Start Program.

The Foster Lake project is also delineated into 16 land areas relating to specific objectives. A brief summary of prominent project features is provided below and identified on Plate B-9.

**Unit A (Project Operations)** consists of the lands downstream from the dam. Included are approximately 81 acres, of which 12.6 acres are leased to the Oregon Department of Fish and Wildlife (ODFW) for operation of the South Santiam Fish Hatchery. The identified Development and Management Concepts for this unit include “lands not utilized directly for operational purposes, and where there are no safety hazards, are available for general public access, scenic enhancement, or limited wildlife habitat improvement.”

**Unit B (Sunnyside School)** is a 10-acre site located on Quartzville Road 3.5 miles upstream of Foster Dam. It is occupied by the old Sunnyside School building. During construction of the Foster and Green Peter Projects, the school served as a project office. The building is now used by the USACE for heavy equipment storage and, has been used by the Head Start School program. These lands will be declared excess to project needs and disposed of to General Services Administration.

**Area C (Reserve Forest Land)** is a heavily forested area located north of the dam, approximately 94 acres in size. These lands are physically separated from other project lands by North River Road, and have limited value for direct project use. However, the location is important from the standpoint of maintaining erosion control, improving wildlife habitat conditions, and maintaining a highly desirable visual backdrop for the west end of the project. The identified Resource Use Objective for this unit is to “preserve (or upgrade where required) existing forest resource lands to maintain the project’s high visual quality.” The primary management practices will focus on improving the site’s visual quality (planting, thinning, etc.), and on any suitable low-intensity recreation improvements (hiking or nature trails) and wildlife habitat improvement programs (planting of browse species).

**Area D (Natural Area)** is a narrow stretch of land consisting of approximately 55 acres located adjacent to and on the north side of North River Road, which parallels the lake’s main body. The

Resource Use Objective for this unit is to “preserve these lands to maintain the project’s visual quality.” The land will be managed to preserve, maintain, and where required, to upgrade the tree and vegetative cover using recognized vegetation programs (planting, thinning, etc.). No trees or vegetation will be removed unless necessary to promote a healthy forest cover (e.g., removal of damaged trees). Use of this land for bicycle and hiking trails at a future date may be considered as long as impact on vegetation cover is limited.

**Area E (Middle Santiam Corridor)** is located on the upper reaches of the Middle Santiam River arm of the project. It consists of a narrow canyon and includes approximately 94 acres. The land is steep and covered with a mixture of conifers and hardwoods interlaced with numerous rock outcroppings. The Resource Use Objective for the Middle Santiam Corridor Area is to “preserve or upgrade the tree and vegetation cover to maintain visual quality and improve wildlife habitat.” These lands will be managed primarily for maintenance of visual values, but some potential for enhancement as an osprey foraging and nesting area exists. Management actions will be directed at improving tree cover, vegetative cover, and osprey habitat. No development that would detract from visual or habitat values will be permitted, but shoreline access for fishing and hiking will be permitted.

**Area F (South Santiam Scenic Corridor)** is a 135-acre area that occupies most of the South Santiam Arm of the lake and has a high scenic value that compliments other uses and activities occurring within the area. The mixed hardwood and conifers, numerous rock outcrops, and steeply sloping canyon walls provide a highly scenic contrast for this narrow arm of the lake. The Resource Use Objective for this area is to “preserve the scenic, wildlife, and recreation values in the area.” These lands will be managed to preserve scenic qualities and, where possible, to implement measures to improve wildlife habitat conditions. Primary management actions will focus on achieving the objective through vegetation management (planting, thinning, etc.). In addition to its highly desirable scenic qualities, the area’s isolated character, topography, and vegetation provide excellent foraging and nesting sites for osprey and great blue herons. No uses that would impact the scenic and/or wildlife qualities will be allowed (e.g., non-project roads, powerlines, pipelines, structures, etc.), however limited development will be allowed for facilities such as low-impact hiking trails).

**Area G (Calkins Park)** is a 7-acre site located approximately 2 miles east of the town of Foster, on Highway 20 at the Quartzville Road intersection on the south bank of the South Santiam arm of the lake. While relatively small, it is a popular spot for fishing, swimming, boat launching, and picnicking. It is the only area with recreation facilities and suitable access on the south shore of the lake. The Resource Use Objective is to “maintain Calkins Park as a low intensity day-use site with emphasis on picnicking and water access.” No development, use, or management will be undertaken or allowed that negatively impacts recreational use. No licenses, permits, or easements will be issued on this area for non-compatible man-made intrusions. Public use will be limited to swimming, hiking, fishing, dispersed picnicking, and unimproved boat launching.

Only limited facility improvements will be provided as necessary to protect public health or safety or to control access. Potential improvements would consist of signing, flush or vault restrooms, and improved water access for fishing and swimming. Habitat improvement for the benefit of wildlife may be accomplished in conjunction with other vegetative management programs.

**Area H (Menear Bend Park)** is a 31-acre park located in the upper project reaches between the South Santiam Arm of the lake and Highway 20. Recreational opportunities at the site include primitive camping, slack water swimming, and fishing. The downstream portion has a heavy tree cover and primitive camping sites. The upstream portion is flat with an open meadow (the remnant of an old farm). Menear Bend Park is the only accessible area on the South Santiam Arm above Calkins Park. The Resource Use Objective for Minear Bend Park is to “maintain the site for low density camping facilities as an alternative to the higher intensity recreational activities now available at other project areas.” These lands will be developed and managed to maintain their natural character and to blend in with adjacent Natural Area lands. Facility development will remain primitive in character; site improvement measures will be limited to providing safe and sanitary conditions. The lands downstream from this site provide a highly scenic setting and some limited habitat for osprey and great blue heron. Site facilities will be limited to primitive camping, restrooms, minimal supporting utilities (drainfields, central water system), gravel access roads, and parking. No licenses, permits, or easements will be issued in this area for such non-compatible man-made intrusions such as powerlines or non-project roads, except on a case-by-case basis and as long as the developed portion of the site would not be impacted.

**Area I (Old Fish Hatchery)** is a 7-acre undeveloped area about 5 miles upstream from Foster Dam. The site, formerly a state fish hatchery, is the only flat, accessible area along the narrow canyon of the Middle Santiam Arm of Foster Lake with the exception of Sunnyside Park, and is heavily used as a fishing access site. The Resource Use Objective of the Old Fish Hatchery area is to “retain this site for limited public shoreline access for fishing and other low-impact activities.” No licenses, permits, or easements shall be issued for such non-compatible man-made intrusions as pumping plants, underground or exposed pipelines, cables, overhead transmission lines, or non-project roads. Development shall be limited to providing facilities for low-impact activities like hiking, fishing, and dispersed picnicking. This area also provides limited habitat for waterfowl. Habitat improvement measures to benefit these species may be implemented when not in direct conflict with the stated objective.

**Area J (Main Lake Shoreline Lands)** includes the narrow shoreline strips of land surround the main lake that are not designated for other uses; the total area is approximately 82 acres. These lands vary from minimally vegetated strips to rip-rapped banks, to larger areas with a mixture of hardwoods and conifers. Shoreline slopes vary from gently sloping to steep, restricting use in many areas. These areas are heavily used for fishing, swimming, and for general water access.

The Resource Use Objective for Area J is to “preserve these lands to provide general public access and, where practicable, to enhance the project’s visual qualities.” These lands generally offer only minimal opportunities but some areas do receive heavy public use. Improvement measures would consist of minimal site upgrading, including shoreline access areas, small, graveled, off-the-road areas, and trails (project-wide system). Limited wildlife habitat enhancement measures complementing adjacent designated wildlife lands will be considered where appropriate. Visual enhancement measures will be concentrated in those areas adjacent to the dam’s abutments and along the lake’s south shore. Because of proximity to surrounding roads, no uses will be allowed that would cause safety hazards or major visual impacts to the shoreline.

**Area K (Andrew Wiley Park)** is located downstream from the dam’s left abutments and includes approximately 10 acres fronting the South Santiam River and Wiley Creek. The site, operated by the USACE, has picnic units and related day-use facilities. Additionally, a boat launch ramp is available for launching smaller types of water craft, such as canoes, rubber rafts, and drift boats. The launch ramp is particularly important as it provides the last upstream launching area for drift boat fishing, rafting, and canoeing on the South Santiam River. The Resource Use Objective for Andrew Wiley Park is to “maintain existing day use facilities, including picnicking, restrooms, open play areas, and river access for drift boat enthusiasts.” No development, use, or management actions that would impact existing facilities will be permitted. No licenses, permits, or easements shall be issued on the area for such non-compatible man-made intrusions as pumping plants, underground or exposed pipelines, cables, overhead transmission lines, or non-project roads. Public use shall be limited to day-use activities such as hiking, fishing, picnicking, and boat launching. Future site improvements will be limited to providing additional picnic units and, where feasible, improving shoreline access for anglers. Development and management actions will focus on maintenance of existing facilities.

**Area L (Shea Point)** consists of 2 acres on the south shore of the lake, approximately 0.5 mile east of the town of Foster on Highway 20. The site, operated by the USACE, includes a small parking area and viewing structure. Little natural vegetation exists at the site because of project construction, relocation of the adjacent Highway 20, and the natural rock outcropping at the location. The site is landscaped to provide an attractive viewing area. The Resource Use Objective for Shea Point is to “maintain the site as a visitor viewpoint, water access area, and multi-agency regional recreation information center.” Due to the proximity of the site to Highway 20, no uses will be permitted that would detract from the site’s visual quality or impact its purpose.

**Area M (Gedney Creek Access)** is a 5-acre site situated along North River Road on the north shore of Foster Lake, approximately 1.5 miles upstream from the dam. The site’s primary purpose is for boat launching, however, limited opportunity exists for development of public facilities on the lightly tree covered upstream portion of the site. Linn County presently operates

the area under a recreational lease with the USACE. The Resource Use Objective is to “retain existing boat launching facilities and develop picnic and other related day-use facilities to help meet the existing and projected increase in regional demand for water-oriented day-use activities. No other uses will be allowed that would reduce the ability to achieve these goals. Because of the site’s linear character and limited land base, no major man-made intrusions will be allowed that would cause visual or physical site impacts or reduce existing or potential recreation uses.

**Area N (Lewis Creek Park)** is located on the north shore, approximately 3.5 miles upstream of Foster Dam. This 40-acre site is currently developed as a day-use area for picnicking, swimming, and related activities. The park is presently operated by Linn County under a recreational lease. The park is extensively developed and has limited capability for further expansion of facilities. On peak weekend days during the summer recreation season, this site is used extensively, to the point of being overcrowded. The Resource Use Objective for Area N is to “maintain Lewis Creek Park as a major day-use area on Foster Lake to help meet the present and future needs and desires for water-oriented recreation activities. No management actions will take place that would impact or reduce the site’s capability to provide a high quality recreation experience, through either visual or physical disturbances. No man-made intrusions will be allowed that are not directly associated with existing recreation facilities. Future expansion will be limited to day-use facilities, and will be developed within the site’s resource carrying capacity. A small wetland area on the northwest portion of the site will be protected from any further development, other than low-impact interpretive trail or hiking paths. While this small wetland area is not of major significance, the site does provide wildlife habitat not found at other locations. In addition, preserving this habitat as a benefit for a small wildlife population, the site offers potential for park interpretive programs. Measures leading to habitat improvement will be considered when not in conflict with the primary resource objective.

**Area O (Sunnyside Park)** is located on the Middle Santiam Arm of the lake, south of Quartzville Road, approximately 3.5 miles east of the town of Foster. This 70-acre park includes both camping and day-use facilities. Sunnyside Park is operated by Linn County under a long-term lease agreement. The Resource Use Objective for Sunnyside Park is to “retain the park as high-quality recreation resource and allow for expansion of picnicking, camping, and water access facilities to meet existing and projected regional demand. No licenses for non-project uses would be allowed that would impact the site’s high value recreation. One of the primary development concepts for this park includes acquisition of adjacent lands. Facilities would be developed within the site’s carrying capacities.

**Area P (Neuhaus Peninsula)** is located on the east end of the lake, 3.5 miles east of the town of Foster, and consists of 155 acres. The site is divided by Quartzville Road. The area lying to the west of the road is associated with the lake, and is used as a foraging and nesting area by osprey, great blue heron, and occasionally wintering bald eagles. The area to the east of Quartzville Road is used by a small population of deer. Public use development contemplated for this area

will be restricted to hiking and bicycle trails, nature trails, interpretive displays, and perimeter parking areas, so long as they are compatible with the resource use objective. Vehicles will be allowed only on existing roads. Shade shelters, waste receptacles, utilities, or other structures will not be allowed, as they would be detrimental in preserving the area's inherent resource values. Appropriate management practices will be used to improve site habitat conditions for wildlife common to the site, including installation of nesting perches and appropriate vegetative control practices (planting of browse species, thinning, etc.). No management action to improve wildlife habitat will be allowed to create undesirable scenic or visual disturbance, when the area is viewed from the lake or surrounding areas.

## **2.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN**

Listed and proposed threatened or endangered wildlife and plant species documented at Foster Lake include: bald eagle (*Haliaeetus leucocephalus*) and northern spotted owl (*Strix occidentalis*). Canada lynx (*Lynx canadensis*) is thought to occur in the broader resource area surrounding Foster Lake. Species of Concern and candidate species documented at Foster Lake include: northwestern pond turtle (*Clemmys marmorata marmorata*), Tall bugbane (*Cimicifuga elata*), and Howell's Montia (*Montia howellii*). The foothills yellow-legged frog (*Rana boylei*), another species of concern, has been extirpated from Foster Lake.

Listed and proposed threatened or endangered wildlife and plant species documented at Green Peter Lake include: bald eagle (*Haliaeetus leucocephalus*) and northern spotted owl (*Strix occidentalis*). Canada lynx (*Lynx canadensis*) is thought to occur in the broader resource area surrounding Green Peter Lake. The only species of concern or candidate species documented at Green Peter are the northwestern pond turtle (*Clemmys marmorata marmorata*) and northern red-legged frog (*Rana aurora aurora*).

## **3. BLUE RIVER**

This overview of USACE project lands at the Blue River project is based upon information provided in an early *Blue River Lake Master Plan* (USACE 1974a).

### **3.1 OVERVIEW OF PROJECT LANDS**

Blue River Lake is located approximately 45 miles east of Eugene. The dam facility is 1.5 miles north of the town of Blue River and 1.8 miles north of the confluence of the Blue River and the McKenzie River. The Blue River project is located within the Blue River District of the

Willamette National Forest. At full pool, the lake's surface area is 940 acres. Except for minor private holdings, USFS land surrounds the entire project. A Memorandum of Understanding (MOU) between the USFS and the USACE set forth divisions of land and water jurisdiction and management responsibilities. This division of management responsibilities dictated the scope of the early *Blue River Lake Master Plan* (USACE 1974a). This plan was limited to providing background resource information for the USFS to assist in coordinating planning of future uses of the Blue River Lake area.

The USACE has jurisdictional responsibilities for management of lands and waters required for operation, maintenance, and protection of project works. In addition, the USACE regulates the reservoir in accordance with authorized project purposes. The USACE operates a visitor's viewpoint on the north side of the main dam. Facilities include a parking lot and a small viewing structure. Plate B-10 identifies the existing facilities and land ownership at Blue River Lake.

Most areas with recreational and land use impact are under the jurisdiction of the USFS. Their responsibilities include the development and management activities not directly associated with operation and maintenance of the dam and reservoir facilities, including development and management of public recreation areas adjacent to the reservoir, recreational use of the lake, collection and disposal of debris from the water surface, and management of the resources on the lands adjacent to and surrounding the project. Overnight camping is available at Mona Campground and boat launching facilities are provided at Lookout Creek ramp. Fishing, swimming, and water skiing are also available at the two recreation areas, both near the upper end of the lake.

At Blue River Lake there are two project operational areas, the main dam and the auxiliary dam. The former is a gravel-filled embankment dam with an impervious core. An intake structure, regulating outlet, and spillway section are located near the south abutment. A public parking area and viewpoint are situated at the north abutment. The structure of the auxiliary dam is similar to that of the main dam except that the former lacks release and regulation facilities. The east abutment is presently used for a boat ramp and parking area.

Blue River Lake lies at mid-elevation on the west slope of the Cascade Range. It controls runoff from a watershed area of 88 square miles that is characterized by steep forested slopes, narrow small creeks, and diverse forest types. Steep slopes and relatively little flat land area adjacent to the pool severely limit the public use potential of the lake. The pool is generally at maximum conservation pool from early in May until mid July. Throughout the autumn, the pool elevation is continually lowered to reach a minimum level by 15 November. The drawdown of the pool exposes extensive raw cut banks, denuded rock areas, and mud flats.

The mountainous region surrounding Blue River Lake has a wide diversity of vegetation but in general, the dominant tree species are Douglas fir and western hemlock. Red alder and bigleaf maple occupy several moist sites and riparian habitats. This region is rich in songbirds, and supports mammals such as black-tailed deer, Roosevelt elk, black bear, mountain lion, chipmunks, and Douglas squirrel.

Ten distinct ecosystem patterns in the lake area were recognized in the early master plan. These were natural openings, wetlands, riparian forests, lowland moist forests, moist forests, dry forests, successional forests, restocked clearcuts, clearcuts, and disturbed areas.

Natural Openings make up a small proportion of the total area and are distinctly different from surrounding habitat.

**Wetlands** are found in various locations within the lowland flood plains. Vegetation typically includes sedges, skunk cabbage, red alder, western red cedar, and black cottonwood.

**Riparian forests** along the streams that flow into the lake are dominated by red alder with some black cottonwood and bigleaf maple. Various conifers may also be present. Vine maple, salal, Oregon grape, as well as numerous herbaceous species typify the understory.

**Lowland moist forests** are floodplain forests of the major streams in the McKenzie River Valley. These forests have a shallow water table and are dominated by large western red cedar and Douglas fir, with a closed canopy. There is an abundance of red alder, bigleaf maple, and poplar mixed in with the conifers. Large incense cedar and sugar pine are found on dry sites in this forest type. Old-growth and mature second-growth forests support an understory of moisture-tolerant species such as swordfern, trillium, sweet bedstraw, sweet colts foot, and Indian peach.

**Moist forests** are dominated by western hemlock, Douglas fir, and western red cedar with a closed or nearly-closed canopy. This forest type is typically found on north and northeast facing slopes with deeper, more moist, fine-textured soils. Understory shrubs characteristic of these forests are mature big leaf maple, dogwood, sparse vine maple, yew, thin-leaved huckleberry, and salal. Characteristic herbs are swordfern, western golden thread, American twin flower, vanilla leaf, trillium, bedstraw, western cool wort, evergreen violet, Oregon oxalis, and much moss.

**Dry forest habitats** contain more Douglas fir than western hemlock and frequently show the presence of two evergreen sclerophyll species, madrone and chinquapin. California hazel, rhododendron, and red huckleberry are also found in these forests, along with vine maple and incense cedar. Low shrubs characteristic of these dry forests are Oregon grape, salal, creeping snowberry, and manzanita. Characteristic of the herb layer are whipple-vine, round-leaved synthyris, and water prince's pines. These forests are typically found on steep south or southwest facing slopes with shallow, rocky soils, as well as on ridge tops with stony soils.

**Successional forests** are of mixed dominance created by past logging. Big-leaf maple, red alder, and vine maple are found among Douglas fir and western red cedar and the occasional western hemlock. Understory varies by canopy closure and moisture regime, but bracken fern, an indicator of disturbance, is common.

**Restocked clearcuts/burns** are dominated primarily by Douglas fir shrubby with a few chinquapin, bigleaf maple, vine maple, California hazel, and ocean spray. There is little understory herbaceous vegetation, but understory varies by site conditions and previous vegetation.

**Clearcuts** are obvious patchwork areas on the landscape, devoid of trees with a highly disturbed understory. Many clearcuts retain slash and logging debris. These habitats are quite variable depending upon slope and aspect. They typically include young Douglas fir along with bracken fern, Oregon grape, blackberry, groundsel, and fireweed.

**Disturbed areas** are the result of road cuts and fills, borrow operations, dam construction, and all other highly manipulated sites. In the area around Blue River Lake, mulching and seeding to establish vegetation has been fairly successful. Some areas are not revegetating at all due to slope steepness and rock exposure.

### 3.2 PROJECT WIDE RESOURCE OBJECTIVES

No project wide resource objectives are detailed for the Blue River Lake project.

### 3.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS

The master plan identifies the land use categories the Blue River Lake project. These designated land use allocations include project operations, Intensive Use Recreation, Low Density Use Recreation, Natural Areas, Reserve Forest Lands. For lands under the jurisdiction of the USFS, the indicated designations are suggested land use potentials only. The geographic extent of these land use categories is shown in Plate B-11.

### 3.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN

The bald eagle is the only listed threatened or endangered wildlife or plant species documented at Blue River Lake. The northern spotted owl, Canada lynx, and other listed, proposed, candidate, and species of concern may occur in the broader resource area surrounding Blue River Lake.

## 4. COUGAR

The Cougar Lake project does not have a current master plan with identified resource objectives and land use plan. Most land surrounding Cougar Lake is under the jurisdiction of the Willamette National Forest (Plate B-12). In 1974 the USACE developed a Design Memorandum to serve as a guide for the orderly and coordinated development and management of land and water areas in and adjacent to the project. That early *Cougar Lake Master Plan* (USACE 1974b) and accompanying *Recreation-Resource Management Appendices* (USACE 1974c) are summarized below.

### 4.1 OVERVIEW OF PROJECT LANDS

A Memorandum of Agreement (MOA) between the Department of Army and the Department of Agriculture was signed in 1964. A project MOU was also signed between the USACE and the USFS that sets forth divisions of land jurisdiction and management responsibilities. Essentially, the USACE is responsible for the lands occupied by the lake, the dam, and related structures. Most areas with recreational and land use impact are under the jurisdiction of the USFS, who is responsible for the development and management of activities not directly associated with the operation and maintenance of the dam. They are responsible for recreational activities adjacent to the reservoir, recreational use of the lake, collection and disposal of debris from the water surface, and management of the resources on the lands adjacent to and surrounding the project. The primary responsibility for the protection, preservation, and enhancement of wildlife habitat at Cougar Lake is with the Blue River Ranger District of the Willamette National Forest, which administers most of the land adjacent to the lake. The USACE involvement in wildlife management consists of habitat enhancement and protection on USACE administered lands at Cougar Lake.

Existing public use facilities at Cougar Lake include Delta Campground, which occupies 17 acres between the McKenzie River and the South Fork Willamette River. Additional recreational facilities include the Echo picnic area and boat ramp and Slide Creek Campground. USACE project land at Cougar Lake occupies 50 acres in two areas that include the dam embankment area and land acquired for road relocation. The USACE -managed facilities at these areas are limited to the visitors viewpoints at both abutments of the dam.

Construction of Cougar Dam and access roads has resulted in a huge cut into bedrock on the east wall of the valley and a variety of smaller disturbances that sharply contrast the natural condition of the surrounding lands. The upper end of the lake is exposed during the winter drawdown period. Wave action, fluctuating pool levels, and steep banks affect the shoreline of Cougar

Lake. This combination of conditions precludes significant vegetation establishment on the banks of the lake.

## 4.2 PROJECT WIDE RESOURCE OBJECTIVES

The *Recreation-Resource Management Appendices* (USACE 1974c) identifies that the objectives for vegetation and wildlife management are to increase the value of reservoir lands for aesthetical, recreational, and wildlife purposes, and to promote natural ecological conditions by following accepted conservation practices. The guide was prepared to insure that protection and enhancement of natural resources are given equal treatment with other objectives in the planning, developing, and managing of water resource projects. The environmental guidelines of preserving, enhancing, conserving, and creating will be used to assure long-term public benefits for recreation and wildlife use.

Five general land management practices have been identified to develop and maintain project lands at Cougar Lake. In managing the vegetation, primary consideration is to be given to wildlife habitat with additional consideration given to aesthetical and recreation benefits. These practices are detailed below:

- On areas allocated for project operation and maintenance (i.e., powerhouse, intake structure, spillway, regulating outlet, access roads, and related parking areas), will be kept clean and neat at all times. Vegetation near these areas will be managed so that it does not interfere with normal operations and maintenance. Plantings will be used adjacent to operations areas to enhance these areas. Consideration will be given to native plant species with habitat and/or food value for wildlife.
- No vegetation will be allowed to grow on surfaces of the dam. Any species that do invade will be removed by cutting and/or herbicide application. Borrowing animals will not be allowed in this area. Other mammals and birds who live and nest on the ground surface and dam structure will be left undisturbed unless their nests interfere with the movable parts of machinery. Interfering nests will be destroyed as soon as discovered to encourage the birds to nest elsewhere.
- At the developed recreation areas (i.e., the viewpoints on the right and left abutments and at the intake structure), wildlife enhancement will be restricted by the small size and human use of these areas. The landscaped areas at these viewpoints may provide limited cover and/or food for small birds and animals. The areas will be highly maintained in accordance with standard practices.
- At areas that are allocated to low-density recreation use, open space, and wildlife habitats, minimal maintenance will be used following any revegetation with native species of disturbed sites. Irrigation and/or additional planting may be necessary, but special consideration will be given to plant species valuable for wildlife habitat and/or

food. Because of the proximity of these areas to project operations and maintenance facilities, they will be protected from fires. In addition, these areas will be protected from misuse or overuse by the public. No trimming or mowing is planned for these areas, except for emergencies or access to facilities.

- At areas suitable for open space and wildlife habitat, but not suitable for recreation because steep slopes create the danger of falling and of triggering rock falls, and because they are highly susceptible to erosion and damage to vegetation. At these areas, minimal manipulation will be the predominant management practice, following any initial revegetation, but irrigation will continue until vegetation becomes established. Future plantings will consider wildlife habitat and food requirements. Trimming, cutting, and mowing are not acceptable management tools in these areas, except for emergencies or special administrative need.

### **4.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS**

No specific land use classifications and management units were identified in the early planning documents for Cougar Lake. Management documents, however, identified five major wildlife habitats at Cougar Lake. These include coniferous forest, brush tree, natural and artificial openings, and streams. The mountainous region surrounding Cougar Lake has a wide diversity of vegetation, but in general, the dominant tree species are Douglas fir and western hemlock, with an understory that varies with microclimate. Ten distinct ecosystem patterns were also recognized at Cougar Lake. These are natural openings, wetlands, riparian forests, lowland moist forests, moist forests, dry forests, successional forests, restocked clearcuts, clearcuts, and disturbed areas. No specific resource objectives are outlined for these units.

### **4.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN**

Cougar Lake and adjacent habitats are known to support bald eagles and northern spotted owls, and may support Canada lynx. Harlequin duck (*Histrionicus histrionicus*) have been observed in the tailrace of Cougar dam.

## **5. FALL CREEK**

The following detail of USACE lands at the Fall Creek Lake project is based upon the *Fall Creek Lake Plan of Management and Development* (USACE 1994).

## 5.1 OVERVIEW OF PROJECT LANDS

Fall Creek is located in Lane County about two miles north of Lowell and 25 miles southeast of Eugene. The dam impounds Fall Creek, a tributary of the Middle Fork Willamette River. At full pool, the lake surface occupies approximately 1,760 acres. Project lands at Fall Creek Lake total 3,537 acres (including both fee, public domain, and flowage easements lands), which were acquired for project operational requirements, including lands needed for the dam site, lake area, construction areas, road and utility relocation, and support facilities and structures. No separable lands have been acquired at Fall Creek Lake for any other purposes, including fish and wildlife, recreation, or other purposes. The USACE has 17 outgrants located throughout the project. Two of these are park and recreation leases to Lane County Parks and Recreation Department. One park and recreation lease is to Lane County School District 52 for SKY Camp, an outdoor youth education and recreation facility. The 14 remaining outgrants are primarily for road and utility rights-of-way. No lands at Fall Creek Lake are presently outgranted to other federal, state, or local entities for management of fish, wildlife, or other purposes. Plate B-13 identifies the land allocations and outgrants for the project lands at Fall Creek Lake.

There are seven designated public recreation sites at Fall Creek Lake. Day-use recreation facilities for boating, water skiing, fishing, swimming, and picnicking are provided at Winberry Creek Park and North Shore Park, which are managed by Lane County Parks and Recreation Department. Swimming, boating, and camping are available at Cascara Campground and Fishermans' Point Campground, operated by the USACE. In addition, there are several small, minimally developed day-use areas (Lakeside 1 and 2 and Free Meadow) are also managed by the USACE. Jointly, these parks provide 104 picnic sites, 61 camp sites, nine boat launching lanes, 246 car parking spaces, 192 car/boat trailer parking spaces, two bath houses, one lodge, and six group cabins. Approximately 249,000 recreation visits were made to Fall Creek project areas in 1996.

Coniferous forests are the predominant vegetative community on project lands surrounding Fall Creek Lake. A unique stand of first-growth Douglas fir is found just below the Falls Creek Dam. The Oregon Natural Heritage Program identifies this area as representative of a rare ecosystem. Deciduous forest types are found in all riparian areas, particularly where streams enter the lake, and are also present along parts of the northern shoreline of Big Fall Creek arm. The dominant species of the deciduous forests are black cottonwood, red alder, and bigleaf maple.

Steep shorelines preclude the growth of emergent vegetation along much of the shoreline. However, wetlands persist as fringe marshes of reed canarygrass are located at the upper end of the Winberry Creek Arm where a shallow flat exists between the creek channel and the shoreline. Reed canarygrass is found in small patches and narrow strips elsewhere on the lake,

including within Cascara Campground and the upstream area across from Peninsula Road. In addition, a 0.5-acre beaver pond is found in the Douglas fir stand within the Tuft Wildlife Area Unit downstream of Fall Creek Dam.

Grasslands comprised by a mix of native and non-native species. A sizable area is situated below the dam and another grassland area is found on the north shore of the lake. Two additional sites are at Sky Camp, located on the south shore of the Fall Creek Arm, and at Cascara Campground, located at the upstream end of the Fall Creek Arm. These grasslands are mowed in areas developed for public use. Upland grass-forb-shrub communities are present only below the dam. They include non-native grasses, teasel, bull and field thistle, and Queen Anne's lace. Himalayan blackberry has invaded the fields. Areas cleared for roads, dam construction, and the construction of recreation facilities comprise the bulk of the disturbed areas. Much of the vegetation of this disturbed area has regenerated over time.

At the Fall Creek project, mature conifer and mixed conifer-hardwood forests occur over a peninsular upland characterizing the project. The overstory of these stands includes Douglas fir, grand fir, incense cedar, and western hemlock. Hazelnut, serviceberry, blackberry, oceanspray, and vine maple are present in the understory with bracken fern, sword fern, and salal comprising the groundcover. Riparian forest includes black cottonwood, big-leaf maple, and western red cedar. Mixed conifer-hardwood forest is common at Fall Creek Lake and represents a mid seral stage of the western hemlock climax community. Douglas fir, incense cedar, big-leaf maple, and black cottonwood comprise the understory. Grasslands occur below the dam and are comprised by a mix of native and non-native species. Wetlands persist as fringe marshes of reed canarygrass located at the upstream ends of Fall Creek. Species composition includes sedges, rushes, flatsedge, woodrush, spike rush, and field mint.

Coniferous forests are the predominant vegetative community on project lands surrounding Fall Creek Lake. Douglas fir is the dominant species, with western red cedar, incense cedar, grand fir, and western hemlock frequently intermixed. Big-leaf maple and red alder are present in mixed/deciduous stands. Large, pure stands of red alder are present where disturbance has created openings in the canopy. Second-growth coniferous stands on Fall Creek range from 40 to 100 years old, and are primarily even-aged as a result of restocking. Adjacent BLM and private lands are intensively managed for timber production, and most of the project area was logged prior to construction of the dam. Mature trees are found interspersed within stands and provide preferred raptor perch sites. A unique stand of first-growth Douglas fir is found just below the Falls Creek Dam. It was identified by the Oregon Natural Heritage Program as representative of a rare ecosystem. This stand is 50 to 70 years old and apparently evolved from white oak savannah, probably maintained by early prescribed burning, into a Douglas fir forest.

It is distinguished from a second-growth community by its diverse native understory flora, which includes several interesting and unusual orchid species.

Deciduous forests types are found in all riparian areas, particularly where streams enter the lake. The dominant species includes black cottonwood, red alder, and big-leaf maple. Conifer seedlings are present throughout much of the understory. Deciduous forests are also present along parts of the northern shoreline of Big Fall Creek arm.

Hazelnut, serviceberry, blackberry, oceanspray, and vine maple are present in the shrub layer of coniferous, deciduous, and mixed forests. Sword fern and salal comprise the most common ground cover in stands with increased canopy closure.

Grasslands are limited in size and extent at Fall Creek Lake. A sizable area is situated below the dam and another grassland area is found on the north shore of the lake. Two additional sites are at Sky Camp, located on the south shore of the Fall Creek Arm, and at Cascara Campground, located at the upstream end of the Fall Creek Arm. Major grass species found at all sites include fescue, bluegrass, bentgrass, brome grass, timothy, and wild oats. Herbaceous species include clover, teasel, and Queen Anne's lace. These grasslands are mowed in areas developed for public use.

Upland grass-forb-shrub communities are present only below the dam. The non-native valley grasslands found here represent an early seral stage following disturbance. Flowering herbaceous plants include teasel, bull and field thistle, and Queen Anne's lace. Non-native blackberry species have invaded the fields, providing cover and food for wildlife and are beneficial in their present distribution. Areas cleared for roads, dam construction, and the construction of recreation facilities comprise the bulk of the disturbed areas. Much of the vegetation of this disturbed area has regenerated over time.

Compared to other Willamette Valley Projects, Fall Creek Lake has very little emergent vegetation within the lakebed. Steep shorelines preclude the growth of emergent grasses along much of the shoreline. The exception to this is the upper end of the Winberry Creek Arm where a shallow flat exists between the creek channel and the shoreline. Reed canarygrass is found in small patches and narrow strips elsewhere on the lake. Palustrine emergent permanently saturated wetlands are rare at the project. However, a 0.5-acre wetland of this type, dominated by sedges and rushes, is located within Cascara Campground, and the upstream area across from Peninsula Road. A 0.5-acre beaver pond is found in the Douglas fir stand within the Tufti Wildlife Area Unit downstream of Fall Creek Dam. Douglas fir and red alder snags in the pond provide good habitat for birds.

The habitat available for wildlife species requiring early or late stages of forest succession is limited. Public lands offer minimum biological or habitat diversity to the area except at the land/water interface. Fluctuations in pool levels and the narrowness, limited extent, and proximity of project land to local roads limit the value of project lands to wildlife. The lack of emergent vegetation along the shoreline coupled with pool fluctuations reduces the projects value for waterfowl nesting and uses associated with marsh species of birds and mammals. Small areas of marshlands, open grassland, shrub and riparian areas exist within the project area, however, they are somewhat limited for supporting wildlife populations. Upland meadow habitat is available below the dam, but the area was compacted and stripped of topsoil as a result of construction and is recovering very slowly. Area adjacent to Fall Creek Lake, including project lands, are important winter range for black-tailed deer and Roosevelt elk. The latter use project lands primarily in winter, but a limited number of black-tailed deer are year-around residents. Fall Creek Lake lies substantially distant any migratory waterfowl flyway, but occasionally small numbers of mallards, wood ducks, mergansers, and other species occur in spring through fall. Overall waterfowl use of the project is light. The extreme depth, lack of aquatic and emergent vegetation, and lack of riparian hardwoods limit the nesting and foraging resources for many duck species. Occasionally, snow geese stop in low numbers during spring migration. Small flocks of Canada geese browse the native bluegrass that grows in the upper arms of the lake during spring. Upland gamebird species found on project lands include ruffed grouse, valley quail, mountain quail, blue grouse, ring-necked pheasant, and turkey. Band-tailed pigeons and mourning doves are migrant species, passing through in spring, summer, and fall. Osprey, American kestrels, and turkey vultures are common at Fall Creek Lake. Other common nongame species at the project area great blue heron, belted kingfisher, and northern flicker. A heron rookery is located downstream from the project at the confluence of Fall Creek and Willamette River. A variety of owls and woodpeckers make use of the conifer and mixed conifer-hardwood stands along the lake. Numerous songbird species use the forest and grass-shrub habitat below the dam.

## 5.2 PROJECT WIDE RESOURCE OBJECTIVES

The master plan identifies 12 lake-wide resource objectives that reflect the capabilities and constraints of Fall Creek Lake's resources and specify how they should be managed to help fill current and projected public needs and desires. These objectives are detailed below:

**Project Operations:** Continue to safely and efficiently operate and maintain Fall Creek Lake to provide the levels of flood control, navigation, irrigation, and downstream power generation authorized by congress.

**Boating:** Manage Fall Creek Lake and develop and maintain access and support facilities to help fill regional needs for a diversity of water-dependent recreation activities, particularly powerboating and water skiing.

**Camping:** Maintain and manage Fall Creek Lake's land and facilities to help support exiting and future needs for overnight camping.

**Day-Use Recreation:** Develop and maintain lands and facilities to meet current and future needs for day-use recreation activities, high and low impact areas.

**Sensitive, Special Emphasis, and Threatened, and Endangered Plant and Animal Species:** Manage habitat to support sensitive, special emphasis, and rare threatened and endangered species with emphasis on bald eagles, spotted owl, osprey, and western pond turtles.

**Fisheries:** Maintain and enhance fisheries potential as recommended by ODFW and as stipulated by mitigation requirements.

**Wildlife:** Manage and maintain wildlife habitat for generate richness and diversity for game and nongame species.

**Cultural Resources:** Protect and interpret cultural resource sites and materials.

**Land Use and Open Space:** Manage and maintain Fall Creek Lake's scenic resources in support of State and county goals for open space and visual quality.

**Interpretation:** Promote public awareness and understanding of Fall Creek Lake's natural resources and its relationship to the USACE water resource role.

**Hiking Trails:** Develop and maintain hiking trails throughout project lands, and provide connections to other trails located within leased areas.

**Coniferous Forest:** Maintain coniferous forest stands, promoting their successional development towards maturity consistent with objectives for recreation, wildlife, and visual quality.

### **5.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS**

The Fall Creek Lake Master Plan identifies the land use classification (Table B-2) for 3,537 acres of project lands (Plate B-14). These classifications include project operations (78 acres), recreation (242 acres), low-density recreation (437 acres), wildlife management (1,024 acres), and water (1,757 acres), and flowage easements (8 acres). The project lands are also divided into 10 management units, each described with regard to location, access, existing site uses, adjacent land uses, vegetation, wildlife, cultural resources, and limitations and hazards. Objectives and specific management and development concepts are identified for each management. Those management units with objectives that relate to plant and wildlife resources are described below.

Table B-2 Fall Creek Lake land use allocation classifications by management unit.

Management Unit	Land Use Classification (acres)					Total Area
	Project Operations	Recreation	Multiple Resource Management		Water	
			Wildlife Management	Low-Density Recreation		
A. Fall Creek Damsite	78					78
B. Tufti Wildlife Area			260			260
C. North Shore Boat Access		16.4			2.8	19.2
D. Big Fall Creek Arm				391		391
E. Cascara Area		60				60
F. Peninsula Point			763.3			763.3
G. Sky Camp		103			30	133
H. Vermillion				37		37
I. Winberry Creek Park		62.1			19.4	81.5
J. Lake Surface					1,704.8	
(flowage easement plus fish release site)				9.2		1,714
Total	78	241.5	1,023.3	437.2	1,757	3,537

**Management Unit B (Tufti Wildlife Area)** encompasses 260 acres of project lands immediately downstream of the dam on both sides of Fall Creek. A major part of the unit occupies land disturbed by construction of the project. This unit is managed for wildlife purposes, with management focussed toward natural succession with minimum manipulation of land forms and vegetation. The unit receives low levels of public use, mostly wildlife viewing and hiking. Facilities are limited to trails and parking. The gentle-sloping areas below the dam are generally open and vegetated by upland embankment and Big Fall Creek Road. The combination of grasslands, deciduous shrubs and trees, and a first-growth Douglas fir stand provides excellent habitat for a variety of upland game birds, song birds, predators, and other nongame species. Wetlands within the unit support a variety of small mammals, Western pond turtles, and various waterfowl. Management objectives for the Tufti Wildlife Area include to “identify and protect candidate and endangered species of wildlife and plants, protect wetlands, and sensitive plant communities,” “maintain species richness and diversity,” promote public awareness of the USACE mission and wildlife management objectives through a passive interpretative program,” and “provide stream-side day-use facilities for Fall Creek to include activities for fishing, boating, and picnicking.”

**Management Unit D (Big Fall Creek)** is a 391-acre site that occupies the majority of the north shore of Fall Creek Lake, a 5.5-mile long strip of land. Second-growth Douglas fir dominates the vegetation from the edge of the lake north to the county road. The forest was logged many years ago and is now primarily coniferous with some of the moist areas dominated by big-leaf maple and red alder. The unit has very limited marsh land except small amounts in some small embayments. The Big Fall Creek Unit provides habitat supporting a diversity of wildlife. Big game, especially black-tailed deer, use the area, but are limited by the county road which they

must cross to get to and from the project. Nearby private and public land has been logged, which has increased the habitat available for big game. The upstream portion of the unit is used, mostly in winter, by Roosevelt elk. Pole stage conifers provide escape and summer thermal cover. The lakebed, which is exposed during the fall and winter months provides forage for elk during winter. Osprey frequent the area with several active nest sites located within the unit. Although the second-growth stands in this unit provide generally poor forage habitat for spotted owls, the area may serve as dispersal habitat for owls nesting east and north of the lake. Western pond turtles have been observed within the unit, especially within several of the small embayments along the shoreline. A western pond turtle was found crossing the road towards the lake in the spring, indicating an upland over-wintering site off project land. Numerous nongame species are commonly observed within the unit and include great blue heron, belted kingfisher, and northern flicker. Game species frequenting the area are ruffed and blue grouse, and mountain quail. Waterfowl numbers are limited because of a lack of aquatic and emergent vegetation, however small numbers of mallards, wood ducks, and mergansers use the shoreline in spring through fall. Upland nesting and over-wintering areas have not been identified, but are likely. Management objectives for the Big Fall Creek Unit include “manage forest for natural succession toward old growth for western pond turtles, spotted owl (dispersal use), bald eagle, osprey, and other old-growth-dependant species,” “control shoreline erosion; develop and implement vegetative growth program for drawdown zone,” “promote species richness and diversity,” and “protect raptor perch and nest sites, with special emphasis on trees within 200 feet of the shoreline.”

**Management Unit E (Cascara Campground Area)** occupies 60 acres on the south shore of the Fall Creek Arm near the upstream end of the pool. It includes the Cascara Campground and Fishermans’ Point Primitive Campground. The tree cover within this unit is dominated by an even-age stand of large second growth Douglas fir, and scattered clumps of deciduous trees including cascara, red alder, and maple. There are several wet areas and some small open areas with native grasses. There is a good screening of vegetation between Peninsula Road and the unit. A small emergent wetland dominated by *Juncus* sp. (about 0.5 acre) is located within the cascara campground site. This unit has diverse vegetation, especially the large second growth fir, provides habitat for a variety of wildlife. Black-tailed deer and Roosevelt elk use the area as low-altitude winter cover, and elk use the lakebed for winter browse. Spotted owls do not use this area for nesting, however, they forage in the forest on the northern edge of the developed area. Waterfowl use of this unit is light, but mallards, wood ducks, mergansers, and Canada geese use the area occasionally. Nongame species benefit substantially from the habitats found in the Cascara Campground Area Unit. Management Objectives for this unit include to “control shoreline erosion along north edge of park,” “protect forest resources for its biodiversity, wildlife habitat, interpretative and scenic qualities,” “develop and implement plan to increase wildlife habitat potential on mudflats adjacent to the campground and to eight feet below full pool,” and “identify, record, and initiate program to control shoreline erosion.”

**Management Unit F (Peninsula)** is the largest management unit at Fall Creek Lake, occupying 763 acres extending from the west border of Cascara Campground Area westerly along the south shore of the Fall Creek Arm, then southeast around the Winberry Creek Arm to the southern boundary of the Vermilion Unit. This unit is comprised of the land lying between the road and the shoreline and is managed for wildlife. A wide variety of land, topography, and vegetative cover are found in the Peninsula Unit, and it is one of the key wildlife management areas at the project. A variety of wildlife use the upland, including big game, endangered species, songbirds, and other nongame animals. The area along the shoreline of the Winberry Creek Arm provides little habitat for waterfowl and western pond turtles. Some limited recreation use occurs in the flatter areas along the upper reaches of the Winberry Creek Arm of the lake. Coniferous and mixed deciduous/coniferous forests encompass about 650 acres of the unit. Douglas fir, western red cedar, and western hemlock are the dominant coniferous tree. There are old-growth Douglas fir scattered around the unit, as well as cedar, hemlock, and fir that display near old-growth characteristics, including an abundance of downed wood and shade-tolerant species beginning to mature. The major deciduous species are big-leaf maple and red alder. The remaining vegetation is deciduous forests and grassland. The deciduous forests are mixed species consisting of black cottonwood, red alder, and big-leaf maple, and are scattered throughout the unit, often associated with drainage into the lake. Grasslands are generally upland grasses and forbs. Only minor amounts of wetlands are found within this unit. Black-tailed deer are the dominant game species resident on project land. Existing vegetation provides them year-around thermal cover and forage. Populations of deer are also abundant in the forest lands adjacent to the project. Shoreline timber along both arms of Fall Creek Lake provides foraging and nesting sites for raptors including bald eagles, osprey, and red-tailed hawk. Bald Eagle perch trees have been identified on the tip of the peninsula. Western pond turtles inhabit several of the small embayments encompassed by lands in this unit, and the flat at the upstream end of the Winberry Creek Arm. Upland nesting and wintering areas have not been identified but may be associated with small drainage ways that flow into the lake. Most of the objectives for the Peninsula Unit are directed toward management of wildlife in the unit. These include the following: “manage unit to protect sensitive species and promote wildlife habitat including spotted owl (dispersal use), maintain species richness and diversity by managing the forest to provide a diversity of habitats including for cavity nesting birds, upland game, reptiles, and amphibians,” “where appropriate, provide opportunity for low-density, dispersed recreation and shoreline access,” “identify, document, and initiate a program to control shoreline erosion,” “manage and provide structures to protect western pond turtle at selected shoreline habitats,” identify and protect western pond turtle nesting and over-wintering sites,” and “identify and protect sensitive reptile and amphibian habitat.”

**Management Unit G (Sky Camp)** occupies 133 acres on the south shore of the Fall Creek Arm of the project. Sky Camp is managed by Lane County School District 52 as a youth education camp under a recreation lease from the USACE. The unit has a variety of vegetative types that is

relatively evenly divided between grassland, coniferous forest, and mixed deciduous/coniferous forest. Second-growth Douglas fir is the dominant species. Several areas within the unit have small wetlands which exhibit typical wetland vegetation and serve as an outdoor study area. The grasslands are found primarily on a gentle slope stretching from the Sky Camp Lodge north easterly to the pool. Wildlife use of Sky Camp is typical of most other areas on the south shore of the Fall Creek Arm. It is used by a wide variety of songbirds, mammals, game and nongame species, that are compatible with moderate levels of human activity. Black-tailed deer are active in the area as well as cougar. The east end of this unit is undeveloped except for nature trails, and provides wildlife habitat values similar to the Peninsula Unit. Management objectives within the Sky Camp unit include to “maintain the natural character of forested section comprising the eastern half of the unit and manage for wildlife and scenic values,” and “identify, record, and initiate a program to control shoreline erosion occurring throughout the western face of the unit.”

**Management Unit H (Vermilion)** occupies 37 acres on the south shore of the Winberry Creek Arm of the pool. There are no formalized recreation facilities within the unit. Most of the area receives very light public use, but a few promontories that open up onto the Winberry Creek Arm of the lake are frequently used by the public. The unit is vegetated primarily by dense stands of second-growth Douglas fir. Some of the existing Douglas fir trees are large. A small amount of mixed conifer/deciduous forest is located near some of the wet spots. Douglas fir, western red cedar, and hemlock combined with red alder and big-leaf maple make up this cover. The unit is used by songbirds and small mammals compatible with moderate levels of human activities. A few black-tailed deer use the area for cover and forage. Raptors, including osprey and bald eagles, use snags and larger trees along the shoreline for perches. Management objectives within this unit include to “manage unit to provide for low-density recreation, dispersed use, and shoreline access with the intent to minimize user impacts on natural resources,” “manage forest vegetation to sustain existing species, promoting natural selection toward old-growth forest,” and “develop and implement program to control shoreline erosion.”

**Management Unit J (Lake Area)** occupies approximately 1,760 acres at full pool. At minimum flood control pool, the surface area is approximately 1,300 acres, leaving an exposed barren drawdown zone of about 460 acres, mostly denuded of vegetation. There are limited shallows at the upper end of each arm and at several stream entrances to the lake. Small amounts of reed canarygrass and native bluegrass grow within these areas. At least one pair of bald eagles regularly use the pool for feeding. Ospreys actively forage on the lake and nest at several locations near the shoreline. The project is somewhat limited for waterfowl, although small numbers of mallards, wood ducks, and mergansers frequent the area from spring through fall. The upstream end of the Fall Creek Arm has developed into a winter feeding area for Roosevelt elk. Black-tailed deer also use the area during winter. Western pond turtles are found in both arms of the project and frequent small inlets and the upper ends of both arms of the lake. Management objectives for the Lake Area Unit include “manage the surface areas and drawdown

zone to provide forage areas for raptors, and habitat for waterfowl and nongame species in support of wildlife management goals for adjacent units, and identify and protect western pond turtle habitat.” “develop and implement plan to vegetate drawdown zones and control erosion through vegetation planted on the shoreline,” and “control buildup of large quantities of floating draft debris in the lake, prevent safety and operational hazards while allowing some drift to beach along shoreline for habitat.”

#### **5.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN**

The bald eagles have been observed at Fall Creek but no nest sites have been identified. A northern spotted owl activity center has been identified near Fall Creek Lake. One nest site has been located within one mile of Cascara Campground, with the home range of the pair including the campground and upper tip of the Fall Creek arm of the lake. Other spotted owls activity centers occur on adjacent forest lands. Canada lynx may occur in the general vicinity of the Fall Creek project. Adult northwestern pond turtles, a species of concern, have been observed in the Fall Creek and Winberry Arms of the lake, and in the Tufti Wildlife Area Management Unit, downstream of the Fall Creek Dam. Other species of concern documented at the Fall Creek project include the northern red-legged frog, long-legged myotis (*Myotis volans*), long-eared myotis (*Myotis evotis*), fringed myotis (*Myotis thysanodes*), and Townsend’s big-eared bat (*Corynorhynchus townsendii*). Howell’s montia (*Montia howellii*) is the only plant species of concern or candidate plant documented at the Fall Creek project.

### **6. HILLS CREEK**

The Hills Creek Lake project lies wholly within the Willamette National Forest and comprised both Department of the Army and National Forest land withdrawn for project purposes. In 1963 a joint *Master Plan for Reservoir Management and Public Use Development* (USACE and USFS 1963) was developed as guide for the orderly and progressive development and administration of the land and water areas of the project. It outlined a plan of development for public use areas and set up policies for management to fit the particular needs of the locality. This information as it relates to vegetation, wildlife, and threatened and endangered species is provided below.

#### **6.1 OVERVIEW OF PROJECT LANDS**

Hills Creek Lake lies approximately 45 miles southeast of Eugene, and is operated as a unit with Lookout Point Dam. At full pool level, Hills Creek Lake has an area of 2,850 acres. The USACE has jurisdictional responsibilities for management of lands and waters required for

operation, maintenance, and protection of project works. In addition, the USACE regulates the reservoir in accordance with authorized project purposes. The USACE's dam administration area includes the lands in the immediate vicinity of the dam that are required by the USACE for project operation and maintenance. Plate B-15 identifies the facilities and land ownership at Blue River Lake as they existed in 1962.

Except for a limited area in the immediate vicinity of the dam required for operational purposes, responsibility for the management of project lands is vested with the USFS. The USFS is responsible for the administration of project lands and waters in the reservoir area upstream of the trash boom, including the determination of land use classifications, development, operation, and maintenance of recreation facilities, fire protection, and the authorization of use and occupancy of others. Responsibilities include the development and management activities not directly associated with operation and maintenance of the dam and reservoir facilities, including public recreation areas adjacent to the reservoir, recreational use of the lake, and management of the resources on the lands adjacent to and surrounding the project.

Recreational facilities at Hills Creek Lake area managed by the USFS. Opportunities for picnicking and other recreational activities are provided at Cline-Clark picnic ground, B.T. Beach picnic ground, Bingham boat ramp, Sand Prairie Campground, and Packard Creek Campground. In addition to their regular campsites, Sand Prairie and Packard Creek also have RV camps without utilities. Packard Creek also offers a swimming beach.

## **6.2 PROJECT WIDE RESOURCE OBJECTIVES**

The early Hills Creek project document (USACE and USFS 1963) does not identify project wide resource objectives for the Hills Creek Project.

## **6.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS**

The 1963 Master Plan does not identify land use classifications, management units, or other land use categories. As previously mentioned, the USFS is responsible for the determination of land use classifications, as well as for the development, operation, and maintenance of recreation facilities. Consequently, no specific land-use classifications and management units are presented herein by the USACE.

## **6.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN**

The bald eagle is the only listed threatened or endangered wildlife or plant species documented at Hills Creek Lake. The northern spotted owl, Canada lynx, and other listed, proposed,

candidate, and species of concern may occur in the broader resource area surrounding the project.

## **7. LOOKOUT POINT AND DEXTER**

The following information of USACE project lands at the Lookout Point and Dexter project is based upon the *Lookout Point and Dexter Lakes Plan of Management and Development* (USACE 1992).

### **7.1 OVERVIEW OF PROJECT LANDS**

The Lookout Point and Dexter Lakes Projects are about 22 miles southeast of Eugene, on the Middle Fork Willamette River. Lookout Point and Dexter Lakes have a combined project area totaling about 10,158 acres. Of that area, approximately 146 acres are located at two hatcheries constructed to mitigate for project-caused fish spawning and rearing habitat losses. The Willamette River Salmon Hatchery is located upstream of Lookout Point Lake near Oakridge, while the Leaburg Trout Hatchery is located along the McKenzie River. Both are operated by the ODFW. The remaining 10,012 acres of the project are located at Lookout Point and Dexter Lakes.

Public lands owned outright by the Federal government total 9,280 acres, including lands acquired specifically for the project, former public domain lands that were withdrawn for project purposes, and former riverbed lands that did not have to be acquired. The remaining 732 acres are flowage easements. All of the project lands at both lakes were acquired for operational requirements, including the dam site, lake areas, construction areas, road and utility relocations, and support facilities and structures. No separable lands have been acquired at either Dexter or Lookout Point Lakes for any other purposes, including fish and wildlife management or recreation. Plate B-16 identifies the project features, land allocations, and outgrants for the project lands at Dexter Lake, while Plate B-17 identifies the project features, land allocations, and outgrants for the project lands at Lookout Point Lake.

Much of Lookout Point Lake lies within the boundaries of the Willamette National Forest and is managed jointly by the USACE and USFS under a MOU approved by the Secretaries of Agriculture and Army. All project lands south of the township line 19-20 south are administered by the USFS. The MOU provides general guidance for the use and administration of USFS lands withdrawn for the purposes of the lake. Under the MOU, the USFS has primary management responsibility for the approximately 2,668 acres of project lands around the upper

end of the lake, and joint management responsibility for the 1,880 acres of lake area within the Willamette National Forest.

A total of about 564 acres at the two lakes have been leased to Lane County to operate and maintain for parks and recreation purposes. The long-term leases cover a 50-year period that began in 1976. Numerous additional easements, permits, and licenses have been granted for utilities and other facilities at Dexter Lake, reflecting the predominantly urban and rural residential character of surrounding land uses. Facilities on project lands include water pumps, intakes, and pipelines, power and telephone transmission lines.

Following construction of both dams, large sections of project land acquired for relocation of the sections of railroad line and highways inundated by the lakes, were turned over to the Southern Pacific Railroad and Oregon State Highway Commission. In many areas, the land turned over to those entities extends into the lake areas. The only rights that the Federal government retained over some of these lands was flowage easement. Consequently, as shown in Plates B-16 and B-17, the USACE administers only small, disjointed parcels along much of the south shoreline of both lakes.

The administrative offices for the Willamette Valley Projects, as well as operations and maintenance compound for the Lookout Point and Dexter Lakes (and Fall Creek Lake) are located on the north shore of Dexter Lake, approximately 1,500 feet below the powerhouse of Lookout Point Dam. Facilities at the compound include the project office, garage, and service storage building, flammable materials storage building with fuel island, vehicle storage building, maintenance garage and a fenced service yard/outdoor storage area. Parking for the visiting public and for employees is provided on the site. The USFS Lowell Ranger Station is located in the city of Lowell on a 3.3-acre parcel of project land.

Lookout Point is located in a narrow valley of the Cascade Mountain foothills, giving it a long, linear overall shape. The south shoreline is relatively smooth, yet steep. The Southern Pacific Railroad and Oregon State Highway 58 follow the length of the lake very closely along that shoreline, crossing the mouths of a number of major tributaries, and forming several small embayments. The largest of these are Goodman Creek, located within the USFS portion of the lake, and Rolling Riffle Creek. The northern shoreline is more convoluted, forming a number of small peninsulas and coves. Dexter Lake is bisected by Lowell market Road, which crosses the lake on a causeway near the middle of the lake. The north shore of Dexter Lake is gently undulating and has slopes which range from very steep near Lookout Point Dam to gently at Lowell Park. The City of Lowell is located on a small terrace that juts into the middle of the lake. As with Lookout Point, the south shoreline is dominated by Oregon State Highway 58, which is located immediately adjacent to it for most of the lake's length. Two small

embayments are formed south of the highway where it crosses over low areas. The lake surface fluctuates about five feet daily, but does not suffer the seasonal drawdown typical of multi-purpose storage reservoirs.

Four recreation areas are administered by Lane County Parks and Recreation Department. These are Dexter Park and Lowell Park on Dexter Lake, and Landax Landing Park and Ivan Oakes Park on Lookout Point Lake. Lowell Park, located on the north shore of the lake immediately west of the Lowell city limit, is a highly developed day use recreation area. Park facilities include a hard surface, multiple lane boat launch ramp, moorage for private and rental boats, a park manager's residence, food concession building, swimming beach, parking for vehicles with and without boat trailers, flush restrooms, picnic areas, and a large area for open play. Dexter Park, located at the south abutment of the dam, is a moderately developed day use area with frontage along the shorelines of both Dexter Lake and the Middle Fork Willamette River below the Dam. Park facilities include a two-lane boat ramp at the lake, and a one-lane, unimproved ramp at the river, ski dock, parking for vehicles with or without trailers, flush and chemical toilets, picnic areas, and open play areas.

At Lookout Point, Landax Landing at one time was a minimally developed recreation area with vault toilets, several picnic or camping sites with tables and fire grills, and an unimproved boat launch ramp that was usable only at full pool. While Lane County continues to hold an active lease for recreation purposes, the area has, for the most part, been abandoned and the facilities removed or deteriorated. Ivan Oakes Park is a minimally developed recreation area that formerly had approximately 21 sites. Similar to Landax Landing, facilities at the park have been removed or destroyed. The site remains open for public use.

Lookout Point Lake has two designated public recreation areas that are located within and operated by the Willamette National Forest. These areas, Hampton Landing Campground and Black Canyon Campground, are both located on the south shore of the lake near its eastern end. Black Canyon Campground is a moderately developed site with 72 camping spaces, three picnic areas, and a boat ramp that provides access to the Middle Fork Willamette River at the extreme upstream end of the lake. Hampton Landing is a small site with 6 camping/picnic spaces and a boat ramp that provides access to the lake at full pool.

The only recreation site on Lookout Point Lake that is managed by the USACE is Meridian Park (formerly called North Shore Access), a minimally developed boat launch and day use area adjacent to the north abutment of Lookout Point Dam. The boat ramp at Meridian Park is currently usable only at or near full pool.

The vegetation cover types on project lands at Lookout Point and Dexter Lakes are presented in Table B-3. Each of these habitats is described below.

Table B-3. Lookout Point and Dexter Lakes Land Cover Classifications

Project	Habitat Types (acres)							Total
	Grass		Shrub	Forest			Disturbed	
	Upland	Managed		Coniferous	Deciduous	Mixed		
Lookout Point	253		107	2,400	65	653	192	3,670
Dexter	45	20	20	8	167	84	86	430
<b>Total</b>	298	20	127	2,408	232	737	278	4,100

**Coniferous Forests:** Coniferous forests are the predominant vegetation community on project lands surrounding Lookout Point Lake, encompassing approximately 2,400 acres within the project area. In comparison, fewer than 10 acres of coniferous forest stands in small parcels are found at Dexter Lake. Douglas fir is the dominant species in the coniferous forests, with grand fir, western red cedar, and western hemlock frequently intermixed. Some hardwood species that may also be found intermixed with the conifers are big leaf maple, red alder, madrone, and Oregon white oak. The coniferous forest stands at Lookout Point and Dexter Lakes are primarily second-growth that range from pole size (10 to 40 years) to mature timber (80 to 100 years), and are primarily even-aged as a result of restocking following harvesting. Adjacent lands are intensively managed for timber production and most of the project area was logged at some time prior to construction of the dams.

**Mixed Conifer-Hardwood Forests:** Remnant deciduous forest stands composed of black cottonwood, big-leaf maple, and red alder are found in small parcels (totaling about 653 acres) along the shoreline of Lookout Point Lake, particularly the south side. In contrast, forested project lands at Dexter Lake are composed primarily of mixed conifer-hardwood and riparian hardwood forests. Stands of Douglas fir and western hemlock mixed with cottonwood and Oregon white oak comprise the second most common forest type at Dexter Lake, encompassing 84 acres. Understory species typically include blackberry, snowberry, and Oregon grape. This type of community is particularly valuable as wildlife habitat due to its diversity of plant and tree species and heterogeneity of structure. Remnant deciduous forests stands are composed of black cottonwood, bigleaf maple, and red alder.

**Riparian Hardwood (Deciduous) Forests:** Black cottonwood is the dominant species in the riparian hardwood stands, which cover 232 acres of project land. Nearly all of this (167 acres) is located along the shoreline of Dexter Lake and in the flat areas below Dexter Dam that are exposed to periodic flooding or a high water table. The existing riparian hardwood forests represent a remnant of what was the most extensive vegetation type in the area prior to construction of Lookout Point and Dexter Dams. These forest stands are typically a seral stage that develops prior to temperate coniferous forest; they also contain conifers and a variety of

understory shrubs. Riparian communities have a high value to a variety of wildlife, including deer, waterfowl, furbearers, and numerous nongame species.

**Oak Savannah:** Remnants of oak savannah community are found on the southwest facing slopes of Disappointment Butte. About 15 acres of this community are located on project lands north of the project office below Lookout Point Dam. This community is decreasing in size due to invasion and growth of coniferous species. Oak savannah is an important plant community for many indigenous and game species of the Willamette Valley and surrounding foothills, and was once abundant in the region.

**Upland Grasslands:** Upland grass-forb communities cover nearly 300 acres of project land that have been disturbed by human activity at Dexter Lake and Lookout Point Lake. The non-native valley grasslands found here represent an early stage of plant succession following dam construction, logging, and agricultural activities. Dominant species of these grasslands include fescue, brome grass, and Queen Anne's lace; flowering herbs present include teasel, bull and field thistle, scattered common centaury, curly dock, parentucellia, camas, wild iris, mints, and equisetum. A large grass-forb community can be found in Dexter Park at the southeast corner of the lake, which was used as a borrow area during construction of Dexter Dam, and features a very thin layer of topsoil. Currently, the primary management undertaken in this upland meadow is mowing for fire suppression. Another grass-forb community is located at the northeast shoreline of Dexter Lake, just upstream from Lowell in an area that was used for rural residences before construction of Dexter Lake. Shrub vegetation is invading the latter area, which is periodically mowed. Maintained grass turf covers about 20 acres in the developed portions of Lowell and Dexter Parks. Grasslands in the park are typically maintained by mowing to facilitate visitor use of these sites. Mowing significantly reduces wildlife value of these lands with the notable exception of Canada geese, American coots, and American wigeon which prefer to forage on short, rapidly growing grasses.

**Shrubs:** Shrub vegetation predominates upstream from Lowell along the north shoreline of Dexter Lake, where large stands of blackberry and Scotch broom have succeeded the grass-forb community in many sites. Areas covered more or less exclusively by shrubs at the two lakes total 127 acres. Shrubs provide a dense barrier protecting bird life, small mammals, and other species from predators and human impacts. Old domestic fruit trees from former homesteads, young fir, and hardwood trees also occur in these areas, forming a structurally diverse and ecologically dynamic habitat with abundant litter forming herbs. If allowed to continue growth and spread unchecked, however, shrubs would soon obliterate what remains of the grass-forb community, lowering biological diversity and habitat value.

**Drawdown Zone:** The high degree of water level fluctuations in Lookout Point Lake, about 110 vertical feet each year, severely limits the suitability of the drawdown zone for establishing and maintaining vegetation. Unlike most of the other lakes in the Upper Willamette drainage, Lookout Point Lake does not have large marsh areas in shallow water zones. Lookout Point

Lake's steep slopes and extended drawdown limit growth of natural emergent vegetation; small patches are located in shallow embayments and upstream backwaters. In 1983, the USFS initiated a program to establish sedges, willows, and bald cypress in the Lookout Point lakebed, primarily to provide winter forage for elk and to increase aquatic habitat diversity. Columbia sedge (*Carex aperta*), a sedge found growing in abundance at Fish Lake, has been found not only to be tolerant of extended flooding, but also to be used extensively by elk for forage. A few small patches of cattail are found along the northern shoreline of Dexter Lake. Marshes provide some forage and brood rearing habitat for waterfowl using the lake. Warmwater fishes and trout also benefit from the cover, forage, and nutrient input provided by marsh vegetation. Dexter Lake, which supports a large growth of aquatic vegetation, including *Potamogeton crispus*, which provides a significant amount of forage for waterfowl, particularly American wigeon and American coots.

Eurasian watermilfoil (*Myriophyllum spicatum*), an introduced species is found in the meander channels and sloughs below Dexter Dam. Milfoil is a nuisance aquatic macrophyte which out-competes native aquatic plants. The rhizomatus root system, vegetative rooting of branch fragments, and tolerance of varied environmental conditions (such as turbidity and water level fluctuations) give it highly invasive capabilities. Milfoil stands can impair navigation, reduce flow rates (and increase sedimentation), and replace habitat. Once established, milfoil is very difficult to eradicate. At Lookout Point, steep shorelines, extended drawdown periods, and cold water temperatures preclude serious infestations by watermilfoil and other aquatic plants.

Since Lookout Point and Dexter Lakes are located in an area of the Lower Cascades surrounded by dense Douglas fir forests, the habitats available for many wildlife species are limited. Project lands offer little in the way of biological or habitat diversity to the area. Fluctuations in lake levels and the narrowness, limited extent, and bisection of project lands by numerous local roads, and the highway and railway limit the value of the project lands to wildlife. Additional limitations to wildlife populations at Dexter Lake are the urban area development of the City of Lowell, and adjacent rural residential developments. Over 700 acres of old growth forest, and 1,000 acres of riparian hardwood forest were lost as a result of dam construction and project lands now consist primarily of even-aged second growth conifer stands. Although the majority of the vegetation of the area is in near monoculture (i.e., Douglas fir) recent logging activity near the lakes may help to produce greater amounts of shrub and forb habitat. This may, in turn, encourage greater populations of those most dependent upon that type of environment. The lack of emergent vegetation along the shorelines minimizes the project's value for waterfowl nesting and use by associated marsh species of birds and mammals. Small areas of marshland, open grassland, shrub, and riparian areas exist within the project area, however, they are insufficient in size to contribute significantly to wildlife populations. Upland meadow habitat is limited, precluding use by species which depend on this habitat.

Areas adjacent to Lookout Point Lake, including project lands, are important winter range for black-tailed deer and elk. Management of project shoreline forests for natural development toward maturity may provide a valuable habitat component for big game in the Lookout Point drainage area. Roosevelt elk use project lands primarily in the winter; primarily the forests and, to a lesser extent, the lakebed along the northern shoreline of Lookout Point Lake. Pole stage conifer stands provide escape and summer thermal cover; mature coniferous forest stands provide important thermal and forage during winter. The value of the drawdown area for forage is limited by the lack of cover; elk will seldom venture more than 600 feet from cover to forage, and most use occurs within 200 feet of the shoreline forest. In 1983, the USFS initiated a program to establish sedges and other vegetation at Lookout Point lakebed, primarily to provide winter forage for elk and to increase aquatic habitat diversity. Elk do not use Dexter Lake.

Black-tailed deer are resident on project lands, which provide year-around thermal cover and forage. Browse forage species are most abundant in the mixed conifer hardwood forests, such as those on the slope east of Eagle Rock and below Dexter Dam. Riparian hardwoods provide fawning, forage, and summer thermal cover.

Lookout Point and Dexter Lakes are located off the main migratory waterfowl flyway. Dexter Lake, however, supports a large wintering population of waterfowl for a lake of its size. Winter counts typically include large numbers of American coots, American wigeon, and lesser scaup, and smaller numbers of ruddy ducks, pied-billed grebes, western grebes, wood ducks, cormorants, and Canada geese. Infrequently, common goldeneye and common loon are identified. In addition to these wintering birds, a resident population of domesticated mallards and Canada geese is also present. The lack of emergent vegetation and daily fluctuations of Dexter Lake that may approach 5 feet in magnitude result in a lack of suitable nesting habitat for most species of waterfowl; accordingly, spring and summer populations of waterfowl decline drastically. The backwater sloughs and riverine areas below Dexter Dam provide habitat for wood duck and mergansers during the nesting season.

Waterfowl use of Lookout Point is slight; the extreme depth, lack of aquatic vegetation, and lack of riparian hardwoods limit the nesting and forage resources for many duck species. Fall migrants travelling between the Willamette Basin and the Klamath Basin do not use the upper reservoir/river area in substantial numbers for short periods of time. These migrant species include mallards, northern pintail, and American wigeon. A small population of Canada geese (Great Basin stock) nests in reed canarygrass marshes that fringe the shallow areas of the coves and inlets north of Highway 58.

Upland gamebird species found on project lands include ruffed grouse, valley quail, mountain quail, and blue grouse. Band-tailed pigeons and mourning doves are migrant species during

spring, summer, and fall. Most gamebird habitat in the project area exists on lands adjacent to Dexter Lake. Ruffed grouse feed and nest in the mixed hardwood conifer forest and riparian hardwood forests throughout the project. Riparian forests provide cover and brood habitat, while deciduous woodlands, especially red alder, provide critical winter food. Alder, birch, and wild hazelnut provide a large component of the winter diet.

Pheasant and valley quail are primarily lowland species thought to be at the upper end of their elevational range in the project area. Expansion of the current population is thought to be unlikely, although a low ridge between the north shore of Dexter Lake and the Fall Creek drainage provides a fair amount of habitat. Valley quail inhabit the area below the project office compound along the upper northern shore of Dexter Lake during the winter. Scattered patches of grass-forb communities in close proximity to shrub cover provide forage and escape cover for quail in this area.

Mountain quail are uncommon but consistent visitors to the grassland and shrub habitat along the north shoreline of Dexter Lake, and make use of the oak woodlands north of the project offices. Movement up and down the adjacent ridge probably occurs along this route. Proximity to water is an important element of mountain quail habitat. They can be expected to occur throughout the project area wherever suitable habitat conditions occur.

Blue grouse are dependent on Douglas fir for needles, buds, and twigs that provide the bulk of their winter diet. Incomplete canopy closure with an interspersed of meadows is necessary to provide summer foods produced by understory shrub species (i.e., Oregon grape, salal, blackberry, and *Vaccinium*). Blue grouse may be present in the more mature coniferous stands along the northern shoreline of Lookout Point Lake, where canopy closure is less than 75 percent. The lack of openings in the Douglas fir forest along the lake, however, reduces its value to blue grouse during the breeding and nesting season.

USACE project lands at Lookout Point and Dexter Lakes supports several osprey nests. Red-tailed hawks are present year-around, and often seen hunting and perching along the northern shoreline of Dexter Lake, and in the vicinity of the ridge north of the office. Great horned owls are seasonally present, and frequently perch at Lookout Point Dam. American kestrels are very common predators on project lands. Nesting of hawks probably occurs on project lands, but somewhat distance from roads and other types of human disturbance. Numerous other nongame species are found at Lookout Point and Dexter Lakes. Great blue herons, belted kingfisher, and northern flicker are commonly seen on or near the lake and adjacent to the shoreline. Two heron rookeries are located downstream from the project on Willamette River islands. One is just below Dexter Dam while the other is at the confluence of Fall Creek. A variety of owls and woodpeckers make use of the conifer and mixed conifer-hardwood stands on the two lakes.

Numerous songbird species use the diverse grass-shrub habitat around Dexter Lake and below Dexter Dam.

## 7.2 PROJECT WIDE RESOURCE OBJECTIVES

The *Lookout Point and Dexter Lakes Plan of Management and Development* (USACE 1992) identifies numerous lake-wide resource objectives that reflect the capabilities and constraints of the resources at Lookout Point and Dexter Lakes, and specify how they should be managed to help fill current and projected public needs and desires. These objectives are detailed below:

***Project Operations:*** To continue to safely and efficiently operate and maintain Lookout Point project to provide the levels of flood control, hydroelectric power generation, and downstream flow regulation for irrigation, navigation, and pollution abatement authorized by congress.

***Cooperative Interagency Management:*** To continue to cooperate with other federal, state, and local entities with overlapping resource management responsibilities at Lookout Point and Dexter Lakes as outlined in the project “vision statement.”

***Improved Recreation Management Efficiency:*** To develop and implement a plan for increasing the efficiency and upgrading the quality of maintenance of recreational sites managed by the USACE, USFS, Lane County, and other agencies or entities.

***Cooperative USACE/USFS Management:*** To continue cooperative efforts between the USACE and USFS to accomplish the mutual objectives identified in the master plan in accordance with the Lookout Point Lake MOU.

***USFS/USACE Land Interchange:*** To prepare a land transfer planning report addressing potential land transfers of land administration responsibility at Lookout Point project between the USFS and the USACE.

***Low-Density Dispersed Recreation:*** To provide opportunities, access, and support facilities for a variety of low-density and dispersed recreation activities, including hunting, fishing, canoeing, hiking, nature study, and birdwatching.

***Eugene-to-Cascade-Crest Trail:*** To cooperate with other sponsoring entities to maintain and promote the use of project lands that provides an appropriate corridor for the trail and is consistent and compatible with other uses, and to develop and maintain the trail and support facilities.

***Intensive Day Use Recreation:*** To maintain existing recreation lands and facilities and develop new facilities to help meet current and projected needs for intensive, water-related day-use recreation activities.

***Camping:*** To develop additional camping facilities as needed to help fulfill future public demands for overnight camping opportunities.

**Regional Interagency Information Center:** To work with other cooperating agencies to identify a site and develop a regional information center that interprets the management roles and responsibilities of various public agencies along the Middle Fork Willamette River.

**Boating:** To manage Lookout Point and Dexter Lakes and develop and maintain access and support facilities to help fill needs for a diversity of boating activities, including powerboating, waterskiing, fishing, sailing, and rowing.

**Low Water Boat Ramp:** To develop and maintain a low water boat ramp that will provide year-around boat access to Lookout Point Lake.

**Willamette Greenway:** To protect, conserve, enhance, and maintain the natural, scenic, historical, agricultural, economic, and recreational qualities of project lands within the Willamette Greenway system in accordance with statewide land use goal no. 15.

**Threatened and Endangered, Special Emphasis, Sensitive, and Unique Species:** To manage habitat to support and protect populations of threatened and endangered, sensitive, special emphasis, and unique species of wildlife, fish, and plants.

**Bald Eagles:** To protect and maintain habitat necessary to support bald eagles using project land and water areas for nesting and foraging.

**Oregon Chub:** To cooperate with ODFW and other agencies to protect and maintain populations and habitat of Oregon chub while continuing to evaluate opportunities for rearing and outplanting the species to expand their distribution.

**Fisheries:** In cooperation with ODFW improve sportfishing opportunities in Lookout Point and Dexter Lakes for salmonids and warmwater game fish.

**Wildlife Species Richness and Diversity:** To maintain and manage habitat to promote wildlife species richness and diversity.

**Black-Tailed Deer:** To maintain and manage habitat to support existing populations of resident black-tailed deer.

**Waterfowl:** To maintain and sustain habitat to support populations of waterfowl.

**Roosevelt Elk:** To maintain and manage habitat at Lookout Point Lake to support populations of wintering Roosevelt elk.

**Upland Habitat:** To maintain and manage upland habitat areas to support a richness and diversity of species, including large and small mammals, upland gamebirds, and reptiles.

**Riparian Mixed Conifer/Hardwood Forests:** To maintain and manage mixed conifer/hardwood riparian forests for wildlife habitat, aesthetic, and interpretive values.

**Coniferous Forests:** Maintain coniferous forest stands, promoting their successional development toward maturity consistent with other objectives for recreation, wildlife, and visual quality.

**Cultural Resources:** To protect and interpret archaeological and historical sites and materials in accordance with the Lookout Point/Dexter Lakes Cultural Resources Management Plan.

**Visual Quality, Aesthetics, and Open Space:** To maintain and improve the scenic and aesthetic resources of Lookout Point and Dexter Lakes in support of federal, state, and county goals for open space and visual quality.

**Water Quality:** To maintain water quality that meets or exceeds standards for water-contact recreation, wildlife, fisheries, and aesthetics.

**Environmental Interpretation:** To promote public understanding of Lookout Point and Dexter Lake's natural environment and its relationship to the USACE's role in water resource development.

**Off-Road Vehicles:** To identify and manage a designated off-road vehicle use area in the drawdown zone of Lookout Point that helps to fulfill regional needs for that activity while minimizing environmental impacts.

### 7.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS

The master plan identifies the land use classification (Table B-4) for 9,269 acres of project lands (Plates B-18 and B-19). These designated land use classifications include project operations (52 acres), recreation (247 acres), environmentally sensitive area (424 acres), low-density recreation (379 acres), vegetation management (2,423 acres), wildlife management (200 acres), future recreation (240), and water (5,252 acres). The USACE project lands at the Lookout Point Lake and Dexter Lake are also divided into 12 and 8 management units, respectively (see Plates B-18 and B-19). In the master plan, each management unit is described with regard to location, access, existing site uses, adjacent land uses, vegetation, wildlife, cultural resources, and limitations and hazards. The master plan also identifies the designated management unit objectives (and rationale) and specific management and development concepts for the unit. Those management units with objectives that relate to plant and wildlife resources are described below.

Table B-4: Lookout Point and Dexter Lake Land Use Classifications by Management Unit.

Management Unit	Land Use Classification (acres)								
	Project Operations	Recreation	Environmentally Sensitive Areas	Multiple Resource Management				Water	Total Area
				Recreation (Low Density)	Wildlife Management	Vegetation Management	Future Recreation		
Lookout Point									
A. Lookout Point Dam	52								52
B. North Shore Access		7							7
C. Signal Point				379					379
D. Lakeview Park							192		192
E. Black Canyon		57							57
F. Hampton		11							11
G. Crale Creek			125						125
H. Goodman Creek							48		48
I. Forest Lands						2,322			2,322
J. Minnow						101			101
K. Eagle Rock			299						299
L. Lookout Point Lake								4,227	4,227
Lookout Point Subtotal	52	75	424	379	0	2,423	240	4,227	7,820
Dexter Lake									
M. Cottonwood					54				54
N. Dexter Park		102							102
O. Middle Fork					61				61
P. Dexter Dam	52								52
Q. Lowell Park		35							35
R. City of Lowell		35							35
S. Orchards					85				85
T. Dexter Lake								1,025	1,025
Dexter Lake Subtotal	52	172	0	0	200	0	0	1,025	1,449
Total	104	247	424	379	200	2,423	240	5,252	9,269

**Management Unit A (Lookout Point Dam)** is a 52 acre unit encompassing the Lookout Point Dam and powerhouse, and the nearby operations compound containing the administrative offices for the Willamette Valley Projects. The compound is located on the north shore of Dexter Lake, approximately 1,500 feet below the powerhouse. Also included in Unit A is a separate 3.3-acre parcel of project land located within the city of Lowell on which the USFS Lowell Ranger District office is located. Large areas of native vegetation have been disturbed through construction and operation of Lookout Point Dam embankment, powerhouse, office, maintenance, and storage areas and buildings, and project and public roads (33 acres). The dam embankment does have a sparse covering of grasses, but shrubs and larger woody vegetation are cleared from it. The slopes above the powerhouse and operations compound are vegetated by an oak savannah community. Open areas of grasses, forbs, and shrubs are interspersed with stands of Oregon white oak and scattered Douglas fir (17 acres). Around and below the operations compound is a small area of second-growth coniferous forest (1 acre). Due to the developed overall condition of Unit A with extensive general disturbance to native vegetation, wildlife habitat value is limited. Oak savannah is an important plant community for many indigenous and game species of the Willamette Valley and surrounding foothills, including black-tailed deer, mountain quail, sharptailed snake, and western rattlesnake. Most resource objectives for Unit A pertain to operation of the dam and other facilities, the objectives include to “manage habitat for constituent wildlife species, with special emphasis on forage production for black-tailed deer, and retention of raptor perch trees.”

**Management Unit B (Meridian Park)** occupies 7 acres immediately east of the north abutment of Lookout Point Dam. It is a minimally developed day-use recreation area that includes the project operations boat ramp (which is usable only for the upper 15 feet of lake elevation), courtesy dock, parking, portable vault toilets, and several picnic tables. Meridian Park is the only recreation site on Lookout Point Lake that is managed by the USACE. It received moderate use by anglers, boaters, picnickers, and sightseers. At this site, native vegetation was disturbed through construction and operation of Lookout Point Dam. Most of the upland areas are taken up by parking lot, roadways, or boat ramp (4 acres). There is a small grassy area between the dam and the boat ramp. Remaining areas around the margins are vegetated by shrubs, particularly blackberry and deciduous trees (3 acres). Due to its disturbed nature, the park has minimal wildlife habitat value.

**Management Unit C (Signal Point)** occupies 379 acres of project lands along the north shore of the lake from Meridian Park to Lakeview Park (Management Unit D, formerly Ivan Oakes Park). Approximately the western two-thirds of this unit, from Meridian Park to Signal Point, are limited to a narrow strip between West Boundary Road and the lake. From Signal Point to Lakeview Park the unit is wider, encompassing lands on both sides of the road. The majority of this unit is under a long-term lease to Lane County for park and recreation purposes. Landax Landing at one time was a minimally developed recreation area with vault toilets, several picnic/camping sites with tables and fire grills, and an unimproved boat launch ramp that was

usable only at full pool. While Lane County continues to hold an active lease for recreation purposes at the site, the area has, for the most part, been abandoned and the facilities removed or allowed to decay. Coniferous forests predominate, encompassing approximately 300 acres. Douglas fir is the dominant species, with grand fir, western red cedar, and western hemlock intermixed. Coniferous forests range from pole size to mature timber and are primarily even-aged as a result of restocking following harvesting. These area limited to narrow corridors between the lake and the project boundary. Some hardwood species that may also be found intermixed with the conifers are big leaf maple, red alder, madrone, and Oregon white oak. The western end is vegetated by a mixed coniferous/deciduous forest (28 acres). The BPA powerline crosses through some sections of this unit. A swath of vegetation underneath the powerline has been cleared of trees and larger woody shrubs, and is now vegetated primarily by upland grasses and forbs (43 acres). Forest stands provide important low-elevation winter cover for Roosevelt elk and black-tailed deer, and perch sites for raptors, including osprey and bald eagle. Nongame species also substantially benefit from this habitat. Resource objectives for the Signal Point Unit include “protect bald eagle perch sites,” promote wildlife species richness and diversity,” and maintain coniferous forest stands, promoting their successional development toward maturity consistent with other unit objectives for low-density recreation, wildlife, and visual quality.”

**Management Unit D (Lakeview Park)** occupies 192 acres along the north shore at approximately the middle of Lookout Point Lake. West Boundary Road skirts along the western edge and provides direct access. This unit is divided into two parcels by the Willamette National Forest. Project lands north of Township Line 19-20 South are leased to Lane County as part of their north shore parks and recreation lease, including the Ivan Oaks Park site. Remaining lands are administered by the Willamette National Forest under an MOU. Ivan Oakes Park is a minimally improved Lane County public access area that has not been regularly maintained since 1977. While many of the facilities at the park have been removed or destroyed, this site remains open for public use and supports moderate levels of picnicking, swimming, boating, and fishing. Although the site is open for day-use activities only, some unauthorized camping does occur. The adjacent USFS lands in the unit support the same type of activities, but at a lower level of use. A large, mature, low elevation coniferous forest that resembles a native, climax ecosystem predominates (approximately 200 acres). The canopy of the forest is dominated by Douglas fir, but there area also significant amounts of western red cedar and western hemlock. Very large (over 300 years old) individual trees of all three species are present. Large big leaf maple trees are found throughout the area as well. The shrub layer is variable with ocean spray, fool’s huckleberry, red huckleberry, hazel, rose, vine maple, and salal occurring. A swath of vegetation beneath the BPA powerline has been cleared of trees and larger woody shrubs and is now vegetated primarily by upland grasses and forbs (10 acres). Forest stands provide important low-elevation winter cover for Roosevelt elk and black-tailed deer, and perch sites for raptors including bald eagles. There is active osprey nesting on the peninsula. Nongame species also benefit substantially from this habitat. Resource objectives for the Lakeview Park unit include to

“promote wildlife species richness and diversity” and to “protect, maintain, and interpret unique low-elevation coniferous forest stands, promoting their successional development toward maturity consistent with other unit objectives for recreation, wildlife, and visual quality.”

**Management Unit E (Black Canyon)** occupies 57 acres near the upstream end of Lookout Point Lake. It is situated between the river and Highway 58. The Black Canyon Campground is administered by Willamette National Forest under a MOU. This unit is currently the most highly developed recreation site at Lookout Point Lake, with 72 campsites, 3 picnicking areas with 9 tables, and a boat ramp. The boat ramp is located at the extreme upper end of the lake area. After about 12 feet of drawdown, it provides access to the river only. This management unit occupies a low, flat, fluvial terrace inside a bend in the Willamette River. Old growth coniferous forests are the predominant vegetation community (approximately 48 acres). Douglas fir is the dominant species, with grand fir, western red cedar, and western hemlock intermixed. Some hardwood species, including big-leaf maple and red alder are intermixed with the conifers. The coniferous forests in this unit provides low-altitude winter cover for Roosevelt elk and black-tailed deer, and perch sites for raptors, including osprey and bald eagle. Nongame species also benefit from this habitat. In the summer, the unit is used primarily by species compatible with high levels of human activity. Among the resource objectives for this unit are to “promote wildlife species richness and diversity,” “protect and maintain the existing mature and old growth coniferous forest stands, promoting their successional development consistent with other unit objectives for recreation, wildlife, and visual quality,” and “promote public understanding of cooperative interagency management of natural and cultural resources at Lookout Point Lake.”

**Management Unit G (Crale Creek)** is a 125 acre unit consisting of two separate parcels of project land on the south side of Highway 58. The western parcel is approximately 65 acres at the mouth of Crale Creek. It encompasses a small embayment (10 acres) of land created by the Highway 58 causeway. The eastern parcel (approximately 60 acres) is located on a steep ridge between the mouths of North and Harper Creeks. Highway 58 forms the east boundary of the eastern parcel. The small embayment at the mouths of North and South Creeks (4 acres) forms the south end of this unit. The Crale Creek Management Unit is designated as a Bald Eagle Management Area, managed by the USFS primarily for protection and enhancement of the Lookout Point Reservoir pair. The lands are also used and managed for other forest resource values, including recreation, visual quality, and habitat for other species (all uses secondary to bald eagle management). Coniferous forests predominate (about 100 acres), with Douglas fir the dominant species. There are small areas of mixed coniferous/deciduous forest (14 acres), as well as disturbed areas along Highway 58 (12 acres). The forest stands in the Crale Creek Unit used to provide nesting sites for the Lookout Point Reservoir pair of bald eagles, who nested there for 10 years since 1979. The pair then moved near Duvall Creek and recently nested near Schweitzer Creek. The forest stands at Crale Creek also provide low-elevation winter cover for Roosevelt elk and black-tailed deer, and perch sites for raptors, including osprey and bald eagle. Nongame species also benefit substantially from this habitat. The resource objectives for the

Crale Creek Management Unit include to “protect and enhance habitat required to maintain nesting bald eagles” and “promote wildlife species richness and diversity.”

**Management Unit H (Goodman Creek)** is a 48 acre unit located along the east side of the Goodman Creek arm of Lookout Point Lake. This unit is administered by the USFS under a MOU. The Hardesty Mountain Trail crosses through the unit, with a small trailhead located at the junction of the trail with Highway 58. The trail is popular for day hikes up to Hardesty Mountain, and provides public access for use of Goodman Creek arm which supports low levels of public use for fishing, picnicking, swimming, and boating. Coniferous forests are the predominant vegetation community, encompassing nearly the entire unit. Douglas fir is the dominant, with grand fir, western red cedar, and western hemlock intermixed. The unit also contains a number of small stands of remnant deciduous forest composed of black cottonwood, big-leaf maple, and red alder (3 acres). These species are intermixed with conifers around the margins of the Goodman Creek arm. The forest stands provide important low-elevation winter cover for Roosevelt elk and black-tailed deer, and perch sites for raptors, including osprey and bald eagle. Nongame species also benefit substantially from this habitat. Resource objectives for the Goodman Creek Unit include to “promote wildlife species richness and diversity” and to “protect and maintain coniferous forest stands, promoting their successional development toward maturity consistent with other unit objectives for recreation, wildlife, and visual quality.”

**Management Unit I ( Forest Lands)** occupy all remaining project lands within Willamette National Forest that were not previously addressed under Units D, E, F, G, or H (2,322 acres ). With the exception of Lookout Point Lake, this is the largest unit at the Lookout Point Project. The Forest Lands Unit is administered by the USFS under a MOU. Rights-of-ways for Highway 58 and the mainline railroad tracks, that parallel the south shoreline of the lake, are managed by ODOT and SPRR, respectively. Coniferous forests, dominated by Douglas fir, encompass approximately 1,670 acres. Grand fir, western red cedar, and western hemlock are interspersed in these stands. Deciduous forests composed of black cottonwood, big-leaf maple, and red alder are also found in small parcels along the shoreline of the lake, remnants of what was the most extensive vegetation type along the valley bottom prior to construction of Lookout Point and Dexter Dams. Stands of young mixed coniferous/deciduous forests (290 acres) occur, particularly along the south shoreline of Lookout Point Lake on lands that were previously disturbed for relocation of the Highway and railroad tracks, but have revegetated naturally. Large parcels of native vegetation remain disturbed due to these features and other human activities (102 acres). The BPA powerline parallels the north shoreline, a swath of vegetation underneath the powerline has been cleared of trees and larger woody shrubs, and is now vegetated primarily by upland grasses and forbs. In addition, there are a number of other small dispersed parcels where vegetation consists predominantly of grasses and forbs (176 acres) or shrubs (105 acres). Areas adjacent to Lookout Point Lake, including project lands, are important winter range for black-tailed deer and elk. Management of project shoreline forests for natural development toward maturity and old-growth may provide valuable component for big-game and

raptors. Roosevelt elk use project lands in winter, primarily the forests and, to a limited extent, the lakebed along the northern shoreline. Black-tailed deer are resident on project lands, which provide year-around thermal cover and forage.. Browse forage species are most abundant in mixed conifer/hardwood forests. Riparian hardwoods provide fawning, forage, and summer thermal cover. The resource objectives for the Forest Lands Unit include “to maintain a high level of scenic quality in visually sensitive landscapes viewed from the lake, Highway 58, and other travel corridors and use areas,” “manage the forest landscape for other resources and uses consistent with visual quality,” “provide opportunities for low-density, dispersed recreation,” and “promote wildlife species richness and diversity.”

**Management Unit J (Minnow)** is a 101-acre parcel along the south shoreline of the lake between the dam abutment and the boundary of Willamette National Forest. It consists of several small, disjoint parcels separated from each other by Highway 58, which closely parallels the shoreline. Only one of the parcels extends south of the highway, encompassing the embayment formed by the Highway 58 causeway at the mouth of Rolling Riffle Creek (approximately 15 acres). This unit is administered primarily by the USACE. This unit provides only low levels of public use, primarily for fishing, and is primarily passively managed for wildlife habitat and visual quality values. Deciduous forests composed of black cottonwood, big-leaf maple, and red alder are found predominantly in two parcels along the west side of the Rolling Riffle Creek embayment, and covering the small peninsula jutting into the lake just east of Rolling Riffle Creek (28 acres). They represent remnants of what was an extensive vegetation type along the valley bottom prior to construction of the dams. Stands of young mixed coniferous/deciduous forests (70 acres) are found along the south shoreline of lands that were previously disturbed for relocation of the highway and railroad tracks. Habitat value is limited; the small, narrow, disjointed parcels between the lake and highway offer little in the way of biological or habitat diversity. Fluctuations in lake levels and disturbance from nearby Highway 58 further reduce the value of project lands to wildlife. Nonetheless, the resource objectives for this unit include to “promote fish and wildlife species richness and diversity.”

**Management Unit K (Eagle Rock)** is a 299-acre unit encompassing the northeast corner of a prominent butte up to its summit. This unit is primarily administered by the USACE, and it is currently managed for the protection and enhancement of bald eagle habitat. Access is purposely limited, but Eagle Rock does support low levels of public use for hiking, sightseeing, and hunting. The quarry site used during construction of Lookout Point Dam is located on the northeast flank of Eagle Rock, but has not been used since that time and there is no plans for future use as a source of rock materials. The summit of Eagle Rock is at elevation 2,300 feet, which is the highest point on the project. The steep slopes of Eagle Rock are largely composed of second-growth 60 to 70 year old Douglas fir forest (approximately 240 acres). However, the top of Eagle Rock and north-facing slopes contain steep, exposed rock bluffs that support some old-growth Douglas fir, with native forbs and shrubs on open areas. The forests below the bluffs on the north and northwest-facing sides of Eagle Rock are typical second-growth Douglas fir

forests. Steep east-facing slopes below the project quarry area covered with loose scree and are vegetated by deciduous forests composed of black cotton, big-leaf maple, and red alder (31 acres). Most of the remainder of the unit is disturbed, including the former quarry site (23 acres). The unique forests on Eagle Rock support a diversity of wildlife species. Most importantly, the Eagle Rock bald eagle nest site is located in this management unit. Roosevelt elk use project lands in the winter, mature coniferous forest stands provide important thermal cover and forage. Black-tailed deer are resident on project lands, which provide year-around thermal cover and forage. Browse forage species are most abundant in the mixed conifer/deciduous forests, such as those on the slopes of Eagle Rock. Ruffed grouse also feed and nest in the mixed conifer/deciduous and deciduous forests in the Eagle Rock area. Numerous nongame species are found in Eagle Rock Unit, including a variety of birds, mammals, reptiles, and amphibians. Resource objectives for the Eagle Rock Unit include to “protect and enhance habitat required to maintain nesting bald eagles” and “promote wildlife species richness and diversity.”

**Management Unit I (Lookout Point Lake)** is 4,360 acres at full pool elevation. This unit includes the entire surface area of Lookout Point Lake, and includes all project lands within the drawdown zone below the maximum flood control pool. A variety of agencies and entities have overlapping responsibilities for management of project land and water areas in Unit L. The lake is managed as a flood control storage reservoir in the combined interests of flood control, navigation, irrigation, and power generation. Water supply, recreation, fish and wildlife, and water quality are secondary purposes. The lake surface is an important recreation resource, used for a variety of boating activities, swimming, and fishing. Lookout Point has a large drawdown zone that is exposed for long durations each year. Management of the drawdown zone includes fish and wildlife habitat enhancement and visual quality management. Steep slopes and a high degree of water level fluctuation in Lookout Point Lake, greater than 100 vertical feet each year, severely limits the suitability of the drawdown zone for establishing and maintaining vegetation. Roosevelt elk use project lands in the winter; primarily the forests and, to a limited extent, the lakebed along the northern shoreline of Lookout Point Lake. A small population of Canada geese (probably Great Basin stock) nests in reed canarygrass stands that fringe the shallow areas of the coves and inlets north of Highway 58. Bald eagles nest and perch along the margins of Lookout Point Lake and forage in the waters. Osprey also nest, perch, and forage along the lake. Two great blue heron rookeries are located a short distance from Lookout Point Lake (outside the project area) and heron use the lake for foraging. Resource objectives for Management Unit I include to “protect and maintain populations and habitat of Oregon chub while continuing to evaluate opportunities for expanding their distribution,” “develop and maintain populations of warmwater and coldwater game and nongame fish species to provide recreational fishing opportunities and forage for bald eagles and osprey,” “improve water quality conditions to promote and protect public health, fisheries, and wildlife,” “provide winter forage habitat for Roosevelt elk,” and “in cooperation with ODFW and Willamette National Forest, improve and expand fish habitat conditions.”

**Management Unit M (Cottonwood)** occupies 54 acres that includes all project lands along the south shoreline of Dexter Lake between the base of Lookout Point Dam (Management Unit A) and Dexter Park (Management Unit N). The unit consists predominantly of one large parcel located at the base of the dam, including two small islands at the upper end of the lake. A second parcel consists of the small (10 acre) embayment lying south of the Highway 58 causeway along the south shoreline. A narrow strip of project land encompasses the embayment. Finally, the unit also includes several other small disjointed parcels separated from each other by the right-of-way for Highway 58. Due to limited public access from Highway 58, Unit M lands support only low levels of public use, primarily for fishing and hunting. The unit is managed primarily for maintaining bald eagle and other wildlife habitat values, and visual quality, as well as for low-density recreation. The low, flat floodplain adjacent to the lake, and the two islands at the upper end of the lake, are vegetated by deciduous forest (17 acres). The hillside adjacent to the dam is vegetated by a mixed coniferous/deciduous forest (31 acres). This type of community is particularly prevalent on lands that were previously disturbed for relocation of Highway 58 but have revegetated naturally with a variety of species. Unit M also contains several small parcels of young coniferous forest (4 acres) and disturbed areas. The upper end of Dexter Lake is a principal foraging area for the Eagle Rock bald eagle pair. Black-tailed deer are resident in the unit's forests, which provide year-around thermal, hiding, and escape cover, and forage. Ruffed grouse feed and nest in the mixed hardwood/conifer and riparian hardwood forests below the dam. Dexter Lake supports a large wintering population of waterfowl for a lake of its size. Peak waterfowl numbers may exceed 4,000 birds, with American coots, greater scaup, and American wigeon most abundant. The habitat value of the several small, narrow, disjointed parcels along Highway 58 offer little in the way of biological or habitat diversity to the area. Resource objectives for the Cottonwood Unit include to "protect and maintain habitat required to support bald eagle use" and "promote wildlife species richness and diversity."

**Management Unit N (Dexter Park)** is a 102-acre parcel that includes the developed portion of Dexter Park as well as all of the project lands downstream of Dexter Dam and south of the Willamette River. The majority of the unit (99 acres) is under a long-term lease (50 years beginning in 1976) to Lane County to operate and maintain for parks and recreation purposes. The upper portion of Dexter Park is between Highway 58 and the south abutment of the dam features structured park development with curbed driveways, wide areas of pavement, and a geometric layout. Facilities include a two-lane boat ramp to the lake, ski dock, large parking areas for both vehicles with and without boat trailers, permanent waterborne sanitary facilities, a linear picnic area overlooking the lake, and open play areas. The development area of the park supports a high levels of public use, particularly for boating, swimming, and picnicking. The lower portion of the park below Dexter Dam is unimproved and supports low levels of dispersed recreation use, including hunting, wildlife viewing, hiking, and fishing. A paved and gravel road skirts along the western edge of the unit at the base of the dam and provides access to the Middle Fork Willamette River where there is a single-lane, unimproved boat ramp. Lane County

operates and maintains a sewage treatment facility within the park lease area. This facility provides sewage treatment for the unincorporated community of Dexter. Native vegetation in the upper developed part of the park has been largely disturbed. It contains large areas of managed grasslands (12 acres), and paved roads, parking areas, the boat ramp, and other facilities (10 acres). Interspersed around the facilities are several small, patchy stands of trees, primarily Oregon white oak, ponderosa pine, and madrone. The predominant plant community in the lower part of the unit is a riparian hardwood forest (approximately 60 acres). An area of mixed coniferous/deciduous forest (20 acres) covers the steep slope adjacent to the developed portion of the park and extends down onto the floodplain area. Within the unit are two oxbow lakes, including a major old oxbow, and a younger, narrow oxbow channel still connected to the river. Both lakes support diverse wetland plant community and adjacent riparian forest. The riparian plant communities have a high value to wildlife because they abut both streams and uplands. They provide valuable habitat for a variety of wildlife, including deer, waterfowl, furbearers, and numerous nongame species. Resource objectives for the Cottonwood Unit include to “promote wildlife species richness and diversity” and “protect and maintain unique plant communities and wildlife species within and adjacent to oxbow lakes.”

**Management Unit O (Middle Fork)** is a 6-acre unit encompassing the northwest corner of the project, including lands downstream of Dexter Dam and the fish collection facilities, and north of the Middle Fork Willamette River. Included in this unit is the eastern tip of Dexter Island. Unit O is undeveloped. It was formerly used as a school outdoor education area; a system of interpretive trails loops through it. The area continues to be used for informal nature study, as well as a variety of other low-density, dispersed recreation activities, including walking for pleasure, and fishing. Most of the unit is vegetated by a mixed conifer/hardwood forest, the largest of its type in the project area. Areas adjacent to the Willamette River and its side channels are vegetated by riparian communities consisting of black cottonwood, red alder, and Oregon ash. A small bottomland stream also traverses the unit. Many aquatic and wetland plants can be found along this stream. The only evidence of any disturbance is the presence of very large, old Douglas fir indicating that the site was altered by historic logging and fire suppression. The forest community provides habitat supporting deer, waterfowl, furbearers, and numerous nongame species. A large number of large mammals have been observed in the unit, including black bear, cougar, and bobcats. Mixed hardwood/conifer forests provide forage, fawning, and summer thermal cover for resident black-tailed deer, and nesting and foraging habitat for ruffed grouse. Mergansers and wood ducks nest in riverine and backwater slough areas. There is a great blue heron rookery (off project land) on Dexter Island). The resource objectives for the Middle Fork Unit include to “promote public understanding of the unique vegetative, wildlife, and cultural values of the unit through environmental education and interpretation,” “protect and maintain rare and unique valley bottom conifer forest, riparian, and bottomland stream systems in accordance with the Oregon Natural Heritage Plan,” “provide

opportunities for low-density, dispersed recreation, including nature study, wildlife viewing, hiking, and fishing,” and “promote wildlife species richness and diversity.”

**Management Unit Q (Lowell Park)** is a 35 acre park on the north shore of Dexter Lake between the City of Lowell and Dexter Dam. It is managed by Lane County for park and recreation purpose under a long-term cost-sharing lease (50 years beginning in 1976). Lowell Park is a highly developed day-use recreation area with a multiple lane boat launch, a marina with 64 year-around moorage slips, park managers residence, food concession building, swimming beach (the only developed beach on the lake), flush restrooms, picnic areas, and a large open play area. Vegetation has been highly modified by development of park facilities and Pengra Road; disturbed areas, including roads, parking, boat launch ramp, and structures account for 8 acres. Much of the unit is open, vegetated by a mixture of maintained grass turf (7 acres) and upland grasses (5 acres). Part of the park consists of a small mixed coniferous/deciduous forest (15 acres) in which the predominant species is Oregon white oak. Lowell Park has limited wildlife habitat value due to its limited size and native habitat, intensive visitor use, and adjacent urban use. A large population of domesticated waterfowl, including mallards and geese, reside in the vicinity of Lowell Park. Resource objectives for the Lowell Park Management Unit include to “promote wildlife species richness and diversity.”

**Management Unit R (City of Lowell)** occupies 35 acres and includes project lands immediately adjacent to developed urban areas of the city of Lowell. Most of the unit lies on the low, flat area between West Boundary Road and the shoreline. The USACE is primarily responsible for administering Unit R lands. A number of adjacent residential landowners are allowed to maintain private boat docks on the lake through permits from the USACE. Numerous easements, permits, and licenses have been granted for utilities and other facilities, reflecting the predominantly urban and rural residential character of lands surrounding the unit. Permitted facilities include roads, water pumps, intakes, and pipelines, power, and telephone transmission lines. Native vegetation in the vicinity of Lowell has been disturbed through urban activities and developments. Adjacent residential landowners have been permitted to modify vegetation for landscaping purposes and to allow access to the lake (25 acres). Much of the remainder of the shoreline is vegetated by deciduous trees, or blackberries and other non-native shrubs. The eastern portion is predominantly open upland grassland (14 acres). The area was used for rural residences before construction of Dexter Lake. Shrub vegetation is invading the area, which is not maintained or mowed. Large stands of blackberry and Scotch broom have succeeded the grass-forb community in many sites. The narrow band of project lands adjacent to the city has limited wildlife habitat value. Upland grasslands interspersed with shrubs provide habitat for a variety of upland gamebirds and small mammals. Resource objectives for the City of Lowell Unit include to “control shoreline erosion” and “promote wildlife species richness and diversity.”

**Management Unit S (Orchards)** is an 85-acre unit consisting of project lands at the northeast corner of Dexter Lake, and includes a small physically separate parcel above West Boundary

Road near the north abutment of the dam. The USACE is primarily responsible for administering this unit. The unit supports a diverse combination of vegetation types. The west end between West Boundary Road and the shoreline was used for rural residences before construction of Dexter Lake. This area is predominantly open upland grassland intermixed with shrubs, old domestic fruit trees and former homesteads, young fir and hardwood trees, forming a structurally diverse and ecologically dynamic habitat and abundant litter-forming herbs (42 acres). Shrub vegetation is invading; large stands of blackberry and Scotch broom have succeeded the grass-forb community. The area is periodically mowed to maintain a balance between the shrubs, open grasslands, and orchards. Most of the low bottomland along the lakeshore is deciduous forest dominated by black cottonwood (10 acres). Remnants oak savannah communities are found on the southwest facing slopes of Disappointment Butte above West Boundary Road and Lookout Point Dam (10 acres). The unit also contains substantial areas vegetated by mixed coniferous/deciduous forest (13 acres) and young coniferous forest (5 acres). A small perennial stream crosses the unit near its west end; a small wetland marsh area is formed at its mouth to the lake. The diverse habitat types support a variety of game and nongame species; open grasslands provide the most valuable upland gamebird habitat in the project area, and also support numerous songbird species. Valley quail inhabit the area below the project office compound along the northern shore of Dexter Lake during the winter. Scattered patches of grass-forb communities in close proximity to shrub cover provide forage and escape cover for quail in this area. Mountain quail are uncommon but consistent visitors to the grassland and shrub habitat along the north shoreline of Dexter Lake, and make use of the oak savannah woodlands north of the office. The upper end of Dexter Lake is an important foraging area for the Eagle Rock pair of bald eagles. Submerged aquatic plants and benthic invertebrates in the shallow water zones along the shoreline of Orchards Unit contribute to forage for waterfowl. The rocky, south-facing hillside above the operations compound and oak savannah vegetation are important communities for many indigenous and game species. This area also supports a large variety of herptiles, including a population of western rattlesnakes which were once common in the project area but the population is decreasing due to lost habitat. Resource objectives for the Orchards Unit include to “protect, maintain, and manage the diverse mixture of habitat types within the unit, particularly old orchards, upland meadows, shrubs, oak savannah, and upland foot plots,” “protect and maintain bald eagle perch sites and foraging areas,” and “promote wildlife species richness and diversity.”

**Management Unit T (Lake Area)** covers 1,025 acres at full pool elevation. The USACE is primarily responsible for administering Dexter Lake. Dexter Lake is managed as a regulatory reservoir for Lookout Point Lake. The project, including both dams, is operated in the combined interests of flood control, navigation, irrigation, and power generation. Water supply, recreation, fish and wildlife, and water quality are secondary purposes. The lake surface is an important recreation resource, used for a variety of boating activities, swimming, and fishing. A few small patches of cattail are found along the northern shoreline at Dexter Lake. Marshes provide some

forage and brood rearing habitat for waterfowl using the lake. Warmwater fishes and trout also benefit from the cover, forage, and nutrient input provided by marsh vegetation. Dexter Lake also supports large beds of submerged aquatic vegetation, including *Potamogeton crispus*, which provides a significant amount of forage for waterfowl. The upper end of the lake is a major forage area for the Eagle Rock pair of bald eagles. Dexter Lake supports a large wintering population of waterfowl. In addition to wintering birds, a resident population of domestic mallards and geese reside in the vicinity of the Marina on Dexter Lake, and a small flock of Canada geese are typically seen in the spring, summer, and fall. The general lack of emergent vegetation and the daily fluctuations of Dexter Lake (may approach 5 feet) combined with the presence of the highway and other urban developments of Lowell, result in a lack of suitable nesting habitat for most species of waterfowl. Resource objectives for the Lake Area include to “protect and maintain populations and habitat of Oregon chub while continuing to evaluate opportunities for expanding their distribution,” “develop and maintain populations of warmwater and coldwater game and nongame fish species to provide recreational fishing opportunities and forage for bald eagles and osprey,” “improve water quality conditions to promote and protect public health, fisheries, and wildlife,” and “promote wildlife species richness and diversity.”

#### **7.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN**

Listed and proposed threatened or endangered wildlife and plant species documented at Dexter Lake include bald eagle, while the northern spotted owl and Canada lynx may occur in the broader resource area surrounding Dexter Lake. Species of concern and candidate species documented at Dexter Lake include northwestern pond turtle and Howell’s montia.

Listed and proposed threatened or endangered wildlife and plant species documented at Lookout Point Lake include bald eagle and northern spotted owl. Canada lynx may occur in the broader resource area surrounding the project. Species of concern or candidate species documented at Lookout Point include the peregrine falcon (*Falco peregrinus*), northern red-legged frog, foothills yellow-legged frog, northwestern pond turtle, and Howell’s montia.

Four pair of bald eagles nest in the vicinity of Lookout Point Lake. Only one of these is on USACE land. The others are all on USFS land. The Eagle Rock territory is on USACE land at the Lookout Point project. The birds from this site frequently forage below Lookout Point dam in Dexter Reservoir, especially in the winter months and in the nest initiation season. They have also been observed flying over Lowell Butte to forage in Fall Creek reservoir, and fishing in the river below Dexter Dam. They may also forage in the western part of Lookout Point reservoir. The eastern boundary of their activities is not known. They are typically not observed around the nest or foraging in Dexter reservoir between the time the young leave in August, through

November. They typically return to the nest territory around the first of December. Eagle Rock is a 200-acre sensitive area managed for the protection of bald eagles.

The Lookout Point/Schweitzer Creek pair has been documented at 5 different nest sites. They forage most frequently in the reservoir near their nest site, between School Creek and Hampton. They are seen fishing the river when the lake is lowered, in the vicinity of Armet Creek.

Two new nest sites were located in 1999, one just east of the Lookout Point/Schweitzer Creek pair's nest. A second territory was identified across the reservoir and approximately 1.5 miles south of Ivan Oaks. Eagles have been observed perching on a tall fir near Highway 58 and the west end of the cove in 1998 and 1999, and newly fledged young have been seen on at least one occasion prior to 1998. It is likely that this nest has been established for some time.

Northern spotted owls may inhabit the broader project vicinity but several nesting pairs and single owls have been confirmed along both the north and south shorelines of upper Lookout Point Lake and most likely use project land for forage.

The northwestern pond turtle have been observed at Buckhead Management Area in the Willamette National Forest, just upstream from the Lookout Point project, and also along the upper north shoreline of the lake.

## **8. DORENA**

This summary of USACE project lands at the Dorena Lake project is based upon the *Dorena Lake Plan of Management and Development* (USACE 1989a).

### **8.1 OVERVIEW OF PROJECT LANDS**

Dorena Dam, on the Row River, is approximately 6 miles east of Cottage Grove. Federal lands at the Dorena Lake project total 2,555 acres. Of this total, the Federal Government owns in fee 2,483 acres. The remaining 72 acres are flowage easements. Most project lands (2,514 acres) were acquired for the requirements of project operation, including lands needed for the dam site, lake area, construction areas, roads, utility relocations, and support facilities and structures. Forty-one acres are separable recreation lands acquired specifically for recreation purposes. The project contains no separable lands acquired for fish and wildlife management or mitigation. Plate B-20 identifies the land allocations and outgrants for the project lands at Dorena Lake.

Six parcels totaling 212 acres of land and water, are leased to Lane County to operate and maintain for parks and recreation purposes. Perpetual easements have been granted to Lane County for rights-of-way for segments of Row River Road and Government Road. Bohemia Inc., through the Oregon Pacific and Eastern (OP&E) Railroad has been granted a perpetual easement for the relocated railway track along the north side of the lake. In addition, several small parcels around the project have been outgranted for private road access, power lines, and other utilities.

Seven sites at Dorena Lake are designated for public recreation. The USACE and Lane County have developed three of these. Popular recreational activities at the project are water skiing, boating, and swimming. Lane County operates Harms and Baker Bay Parks. These parks have facilities for picnicking and boat launching. Baker Bay also provides overnight camping, and is the largest, most highly developed park at Dorena Lake. Schwarz Park is operated by the USACE. It is just downstream of the dam and provides a minimally developed campground with river access. Overall, Dorena Lake offers 122 campsites, 29 picnic sites, 3 boat launch lanes, a marina with 27 seasonal moorage spaces, courtesy boat docks, play areas, restrooms with showers, and other related facilities. Four other sites leased to Lane County are also designated as parks, but are undeveloped. These include the Bake-Stewart (22 acres), Vaughn (33 acres), Row Point (12 acres), and Teeter Creek (34 acres). In 1996, about 433,300 recreation visits were made to the Dorena Lake project.

Dorena Lake has fairly diverse habitats for attracting and maintaining wildlife, however, wildlife use is limited by the fluctuations in lake levels, coupled with the narrowness, limited extent, and bisection of project lands by roads limit. The primary vegetative cover along the lake is second-growth coniferous forest dominated by Douglas fir. Mixed conifer-hardwood, deciduous forest, and riparian woodlands also occur around the perimeter of the lake. The deciduous forest occurs in low-lying areas, where bigleaf maple, red alder, and willow comprise the overstory, while conifers are scattered throughout these stands. A complex of upland forest, marsh, and riparian habitats typify Teeter Creek on the east side of Dorena Lake, and the southeast and northwest ends of the lake. Other habitats at Dorena Lake include marshland, shrubs, grasslands, and disturbed areas. Each of the major habitat types at Dorena Lake is described below.

Dorena lake has fairly diverse habitats for attracting and maintaining wildlife. The fluctuations in lake levels, coupled with the narrowness, limited extent, and bisection of project lands by roads, however, limit wildlife use. The primary vegetative cover is second-growth Douglas fir. Along the shoreline of the lake, grand fir, western red cedar, and western hemlock persist with an understory of blackberry, salal, Oregon grape, bracken fern, and snowberry. Mixed conifer-hardwood, deciduous forest, and riparian woodlands also occur around the perimeter of the lake. The deciduous forest occurs in low-lying areas, where big-leaf maple, red alder, and willow

comprise the overstory, while conifers are scattered throughout these stands. Teeter Creek, on the east side of Dorena Lake, and the southeast and northwest ends of the lake are typified by a complex of upland forest, marsh, and riparian habitats. Descriptions of each of the major habitat types on Fern Ridge project lands follow.

**Marshland:** Extensive marshes (368 acres), comprised mostly of reed canarygrass (rushes and sedges are uncommon), occur in shallow water zones throughout the lake, particularly in the upper end along the north shore from the mouth of the Row River downstream to the mouth of Teeter Creek. The monoculture of reed canarygrass limits the value of these marshlands for wildlife. Pool fluctuations also impact wildlife use. During a typical year, the marshes would be exposed from mid to late summer until early spring, except when the project is filled for flood control purposes. Inundation of the marshes during spring may preclude and/or destroy nests of waterfowl and nongame species. Conversely, low water levels from drawdown, significantly decrease use, particularly by aquatic wildlife and fish. Recreational use of marshland habitats at Dorena Lake is primarily fishing for largemouth bass.

**Coniferous Forest:** Coniferous woodlands, primarily Douglas fir, cover 244 acres (approximately 30 percent) of the project lands above the pool. Well-developed stands are present along the south shore, and extend into the area downstream from the dam. Larger stands of Douglas fir, grand fir, western red cedar, and western hemlock are found at Schwarz and Baker Bay Parks. Except for the open upland meadow area at the northeast corner of the lake, this habitat type occurs along the perimeter of the lake. The wildlife value of forested areas on the project is limited due to the fragmented and linear nature of most stands, and the presence of adjacent roads and parks, and their associated human disturbance. There are exceptions, however, including the forest immediately below the dam. In addition, large Douglas fir trees along the shorelines of the lake and the Row River are used as perch sites by bald eagles and other raptors.

**Deciduous Woodlands:** Areas with stands of deciduous trees cover 100 acres at Dorena Lake. These habitats tend to occur in the lower, poorly-drained areas. The canopy is typically closed, and big-leaf maple, alder, and willows co-dominate. The shrubby understory is stick with evergreen and Himalayan blackberries, blue elderberry, and bracken fern. Numerous herbs and grasses are also present. There is a riparian community downstream from the dam that is supports Oregon ash and Oregon white oak. These areas generally support a rich variety of wildlife, particularly songbirds and small mammals. Oregon white oak is beginning to re-colonize formerly cultivated fields within Bake Stewart Park. This species provides valuable acorn mast for forage, as well as cover opportunities for black-tailed deer, upland game birds, and other species.

**Mixed Woodlands:** Most of the forested areas at Dorena Lake are mapped as deciduous or coniferous, representing various stages in forest succession. Approximately 49 acres of project

lands are mixed woodlands, where coniferous and deciduous trees co-dominate. The area downstream of the dam, East Wildlife Area, Bake Stewart Park, and Teeter Creek offer the best examples of mixed forest. The shrub understory is similar to that found in the deciduous woodlands. The northeast corner of the project and the Teeter Creek area has a significant amount of old orchard habitat present, coupled with a relatively dense understory of shrubs, primarily Himalayan blackberry. The diversity of food and cover make this habitat type very important for a variety of wildlife species.

***Shrubs:*** Areas covered more or less exclusively by shrubs occur scattered throughout the project in small areas totaling about 45 acres. These areas consist mostly of blackberries, roses, and hawthorn thickets. Young fir and hardwood trees are often found in these areas. In some areas blackberries are a nuisance because of their vigor and competitive ability compared to other plants. They tend to invade upland meadow habitats. However, shrubs do provide a dense barrier protecting bird life, small mammals, and other species from predators and human impacts.

***Grasslands:*** Dorena Lake's grassland areas comprise 242 acres. Approximately 147 acres of these area upland, and over half of these are in the area downstream of the dam. Two smaller blocks of upland grasslands are found at the lake's upper end. The 72 acres of low grasslands are nearly all situated along the north bank, near the lake's upper end, in the transition between upland areas and the reed canarygrass wetland. These grasslands are primarily comprised of non-native species including fescue, brome grass, and Queen Anne's lace; flowering herbs present include teasel, bull and field thistle, scattered common centaury, curly dock, parentucellia, and ox-eye daisy. Tansey ragwort and Scotch broom, nuisance plant species, are present in grassland habitat, particularly below Dorena Dam. Mowed turf grasslands, totaling 23 acres in all, are found at Schwarz and Baker Bay Parks. A small (3- to 5-acre) remnant of native Willamette Valley red-fescue-bunchgrass prairie is present at Schwarz Park and the adjacent Dorena Seed Tree Orchard property. This is one of only four known remnants of this once-vast plant community. Grasslands are preferred habitat for quail, pheasant, and many nongame species. Raptors, particularly northern harriers, red-tailed hawks, and American kestrels, use this habitat extensively for foraging. Great blue herons often use this habitat to forage on mice and voles, particularly during winter. Currently the primary management undertaken in the upland meadows is mowing for fire suppression. This practice significantly reduced wildlife value of these lands with the notable exception of Canada geese, which prefer the short grasses.

***Disturbed Areas:*** Areas cleared for roads, Dorena Dam, recreation area features, utilities, and buildings, comprise 137 acres at the lake. Almost half of the disturbed areas lie at the west end of the project where the dam, project office, and maintenance yard, Schwarz Park, roads, and the OP&E railroad area located. Roads and the railroad represent most of the disturbed area along the lake's north shore. The area cleared for the lake flowage, below maximum conservation pool level, totaled 1,735 acres.

**Nuisance Aquatic Plants:** Eurasian water milfoil, which occurs at three other Upper Willamette Valley Project lakes, has not been noted at Dorena Lake.

Project lands at Dorena Lake support a resident population of black-tailed deer, while additional deer occur in winter. The upland area at the northeast corner of the lake, which contains meadows interspersed with mixed woodlands, old orchards, and shrubs represent good deer habitat at present, although expanding blackberry thickets may reduce available habitat in the future. Roosevelt elk and black bear occasionally occur in the area. Waterfowl are fairly sparse at Dorena Lake probably due to the distance of the lake from the main Willamette River and agricultural lands. In addition, the marsh habitat that is a monoculture of reed canarygrass provides little value as waterfowl habitat. However, migratory waterfowl using Dorena Lake include Canada goose, mallard, wood duck, northern pintail, American wigeon, northern shoveler, American coot, lesser scaup, green-winged teal, and common and hooded mergansers. Waterfowl species nesting at Dorena Lake, in small numbers only, are Canada goose, mallard, and wood duck. Two large waterfowl nest mounds were constructed in the marsh at the upper end of the lake in 1987, to improve nesting conditions for Canada geese and mallards. Species of upland gamebirds found at the lake include ring-necked pheasant, valley quail, and mourning dove. All favor grass/shrub habitats, such as are found near the downstream area below the dam, as well as in the uplands at the northeast corner of the lake. Ruffed grouse and band-tailed pigeons inhabit forested areas of the project. Numerous species of Nongame birds and small mammals are found at Dorena Lake. Areas below the dam and at the northeast corner of the lake provide a diversity of habitats for songbirds and small mammals. These areas provide relatively large blocks of undisturbed lands with an interspersed of habitats and high structural diversity. The intermixture of coniferous forest, deciduous forest, grasslands, marshlands, and lake habitats provide the appropriate life requisites for many species. These areas are occupied by green-backed heron, spotted sandpiper, and songbirds such as warblers, flycatchers, chickadees, and nuthatches. Red fox have been noted in the lake's upper end. Great blue herons forage primarily in the reed canarygrass area and along the shorelines and river channels. Two heron rookeries are located near the project. One is west of the dam and supports 7 to 9 nests. The second is located in the Harms Creek drainage and supports 8 to 9 nests. Virginia rails and soras also make use of the reed canarygrass areas and associated channels and shorelines. These two species would be expected to nest near the perimeter of the pool in the reed canarygrass marsh. Migrating shorebirds make use of the mudflats and drawdown zone which provide them foraging and roosting opportunities. Both bald eagles and osprey nest at Dorena Lake, and perch in tall coniferous and deciduous trees along the Row River downstream from the dam. Tall trees and snags abutting the lake are also used for perching and hunting. A bald eagle nest is located approximately 1.5 miles from project lands. Wintering bald eagles appear to concentrate their activities below the dam. Red-tailed hawks, American kestrels, and northern harriers occur on the project, foraging primarily in the grasslands. Red-tailed hawks also occur in forested habitats

where Cooper's and sharp-shinned hawks are also found. The limited extent of forested habitat on the project lands and adjacent levels of human disturbance and development, probably precludes most of these species from nesting there. The project lands at Dorena Lake are thought to support, in addition to bald eagle, northern spotted owl and northwestern pond turtle. Also thought to occur at the project is common loon, Lewis' woodpecker, willow flycatcher, purple martin, western bluebird, and yellow warbler.

## 8.2 PROJECT WIDE RESOURCE OBJECTIVES

The *Dorena Lake Plan of Management and Development* (USACE 1989a) identifies 16 lake-wide resource objectives that reflect the capabilities and constraints of Dorena Lake's resources and specify how they should be managed to help fill current and projected public needs and desires. These objectives are detailed below:

***Project Operations:*** Operate and maintain Dorena Lake safely and efficiently to provide the levels of flood control and downstream flow regulation for irrigation and navigation authorized by congress.

***Boating:*** Manage Dorena Lake and develop and maintain access and support facilities to help fill regional needs for a diversity of water-dependent recreation activities, particularly sailing.

***Camping:*** Maintain Dorena Lake's lands and facilities to help support existing and future needs for overnight camping, particularly group camping.

***Park and Recreation Lease Areas:*** In cooperation with Lane County, cancel leases for undeveloped park sites at Dorena Lake and transfer management responsibility for those sites back to the USACE.

***Intensive Day-Use Recreation:*** Maintain existing lands and facilities, and develop new facilities, to help meet current and projected needs for day-use recreation activities, including picnicking, swimming, sightseeing, and other activities.

***Low-Density Dispersed Recreation:*** Provide opportunities and support facilities for low-density dispersed recreation activities, including hunting, fishing, birdwatching, and other activities.

***Fisheries:*** In cooperation with ODFW, develop and maintain a fishery for wild warmwater game fish and continue stocking hatchery trout to provide recreational fishing opportunities and forage for raptors.

***Threatened or Endangered Plants:*** Manage habitat to support species designated as sensitive, special emphasis, or threatened and endangered, with particular emphasis on bald eagles and osprey.

***Nongame Wildlife:*** Maintain and manage habitat to promote nongame wildlife species richness and diversity.

**Upland Habitat:** Maintain and manage upland habitat areas to support black-tailed deer, upland game birds, and furbearers.

**Waterfowl:** Manage habitats to maintain and sustain 20,000 annual waterfowl use days at Dorena Lake, including 25 pairs of nesting Canada geese and 50 pairs of nesting ducks.

**Water Quality:** Maintain standards of water quality that protect water-contact recreation, wildlife, and fisheries.

**Threatened and Endangered Plant Species:** Maintain and protect populations of candidate plant species for threatened and endangered status.

**Land Use and Open Space:** Maintain and manage Dorena Lake's scenic resources in support of state and county goals for open space and visual quality.

**Environmental Interpretation:** Promote public understanding of Dorena Lake's natural environment and its relationship to the USACE's role in water resource development.

**Cultural Resources:** Protect and interpret cultural resources sites and materials.

### 8.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS

The Dorena Lake Master Plan identifies the land use classification (Table B-5) for 2,483 acres of project lands. These designated land use classifications include project operations (153 acres), recreation (146 acres), future and/or inactive recreation (6 acres), low-density recreation (55 acres), vegetation management (195 acres), wildlife management (179 acres), and water (1,749 acres). At full pool, the lake surface occupies approximately 1,750 acres. The USACE project lands at Dorena Lake are also divided into 11 management units (see Plate B-21). In the master plan, each management unit is described with regard to location, access, existing site uses, adjacent land uses, vegetation, wildlife, cultural resources, and limitations and hazards. The master plan also identifies the designated management unit objectives (and rationale) and specific management and development concepts for the unit. Those management units with objectives that relate to plant and wildlife resources are described below.

The master plan identifies the land use classification (see Table B-5) for 734 acres of project lands (Plate B-21). These designated land use classifications include project operations (153 acres), recreation (146 acres), low-density recreation (55 acres), vegetation management (195 acres), wildlife management (179 acres), and future recreation (6 acres). The remaining area is open water. The USACE project lands at the Dorena Lake Project are also divided into 11 management units (see Plate B-21). In the master plan, each management unit is described with regard to location, access, existing site uses, adjacent land uses, vegetation, wildlife, cultural resources, and limitations and hazards. The master plan also identifies the designated management unit objectives (and rationale) and specific management and development concepts

for the unit. Those management units with objectives that relate to plant and wildlife resources are described below.

Table B-5 Dorena Lake land use classifications by management unit.

Management Unit	Land Use Classification (acres)							Total
	Project Operations	Recreation	Multiple Resource Management				Water	
			Low-Density Recreation	Wildlife Mgmt	Vegetation Mgmt	Future Recreation		
A. Lower Row	153							153
B. Schwarz Park		76						76
C. Baker Bay Park		70					18	88
D. South Shore					70			70
E. Vaughn Park			33					33
F. Bake Stewart Park			22					22
G. East Wildlife Area				145			348	493
H. Teeter Creek				34				34
I. North Shore					125		8	133
J. Harms Park						6		6
K. Lake Area							1,375	1,375
<b>Total</b>	<b>153</b>	<b>146</b>	<b>55</b>	<b>179</b>	<b>195</b>	<b>6</b>	<b>1,749</b>	<b>2,483</b>

**Management Unit A (Lower Row)** encompasses all of the project lands west (downstream) of Dorena Dam on both sides of the Row River, with the exception of those within Schwarz Campground. This unit contains most of the operation and maintenance facilities and structures for Dorena Lake, including the concrete spillway, earth fill dam embankment, adit house, and associated structures. It also contains the project office, maintenance shop, and storage areas. These disturbed lands occupy approximately 36 acres. The lands below the embankment consist of a mosaic of upland grasses (62 acres), interspersed with stands of coniferous (23 acres) and deciduous (14 acres) woodlands. On the north side of the Row River just below the dam is a forested community that is an example of a native, low-elevation Douglas fir-incense cedar river terrace forest. The remainder of the unit along the north shore is dominated by a mixed community of grasslands, coniferous, and deciduous woodlands, and shrubs (19 acres). A riparian oak-ash community parallels the stream that divides the field below the dam on the south side of the river. Lands in this unit that are not used for operational purposes support a variety of wildlife species. Bald eagles perch on the taller Douglas fir trees along the north bank of the Row River. Management objectives for the Lower Row Unit include to “manage habitat for constituent wildlife species, with special emphasis on maintenance of mature forests, upland game bird nesting areas, and forage production, and cover for black-tailed deer,” and “maintain and protect raptor perch trees.”

**Management Unit B (Schwarz Park)** occupies 76 acres just below the dam embankment on the south bank of the Row River, fronting the river for about 0.6 miles. Schwarz Park is a very popular, moderately-developed overnight camping area operated by the USACE. This unit is vegetated primarily by stands of coniferous (26 acres) and deciduous (16 acres) woodlands interspersed with grasslands. Most of the grasslands (13 acres) are managed park areas that are regularly mowed. An important native grassland community (2 acres) is located near the park entrance. This community is identified as native red fescue-bunchgrass prairie. About 13 acres within the unit consists of roads, parking, and other disturbed areas. The following management objectives are identified for the Schwarz Park management unit: “protect and maintain unique native upland prairie communities,” “protect and maintain raptor perch sites,” promote wildlife species richness and diversity.”

**Management Unit C (Baker Bay Park)** occupies 88 acres, including 18 acres of open water) along about 1.3 miles of the southwest shore of Dorena Lake. This unit is leased to Lane County which operates and maintains the site for parks and recreation purposes. The Baker Bay Unit is vegetated mostly by woodlands. Coniferous forests predominate (40 acres), with a portion of the park having been identified as a low-level riparian area that was once common throughout the Willamette Valley. This native forest is dominated by Douglas fir and grand fir, with both incense cedar and western red cedar. The trees are mostly between 100 and 200 years old, but a few older individuals are present. Deciduous (3 acres) and mixed (4 acres) forests also occur in the park. The woodlands are interspersed with areas of upland grasslands (8 acres) located along the shoreline west of Baker Bay, and managed park grasslands (8 acres) located around the bay. Shrubs, including blackberry and Scotch broom are invading upland areas at the west end of the park. Developed recreation facilities, including park roads, parking and boat launch lanes, cover the remainder of the unit (8 acres). Baker Bay is the single developed recreation facility on the shoreline of Dorena Lake and receives very heavy use during the summer recreation season, for both day-use activities, and overnight camping. Management objectives within the Baker Bay unit include “control shoreline erosion to improve water quality and promote public access” and “protect and maintain raptor perch trees along the shoreline.”

**Management Unit D (South Shore)** occupies 70 acres comprised of three separate parcels located along the south shore of Dorena Lake. They consist primarily of narrow, steep strips of land, nominally 100 feet wide. The South Shore Unit is vegetated primarily by coniferous (38 acres) and deciduous (24 acres) forests, and smaller areas of mixed forest (4 acres). There are very small areas (less than one acre each) of upland and lowland grasses and shrubs interspersed throughout. Approximately 9 acres of the unit have been disturbed, including rights-of-way and cut and fill for Government Road. Raptors use the snags and larger trees along the shoreline for perches. Management objectives for the South Shore Unit include to “protect and maintain raptor perch sites,” “promote wildlife species richness and diversity,” and “stabilize the shoreline to prevent erosion, maintain water quality, and allow public access.”

**Management Unit E (Vaughn Park)** occupies 33 acres along the south shoreline of the Row River, at the extreme upper end of Dorena Lake. This unit is also leased to Lane County to operate and maintain for parks and recreation purposes. Site improvements are limited to a dirt access road, portable vault toilets, and two designated primitive campsites. It receives moderate use by campers, fishers, swimmers, and picnickers. The Vaughn Park unit is wooded with coniferous trees, mostly second-growth Douglas fir, dominating upland areas (11 acres) and deciduous trees (6 acres), mostly alder, willow, and cottonwood lining the shoreline and other lower elevation areas. Interspersed throughout the unit are smaller areas of upland and lowland grasses (7 and 4 acres, respectively) and shrubs (4 acres). The shrub areas are mostly former upland meadows that have been invaded by Scotch broom and blackberry. Emergent marshes consisting primarily of reed canarygrass, are found in the wetland fringe along the shoreline. Approximately 2 acres are disturbed, including the park road and right-of-way of Government Road. One of the objectives of this management unit is to “promote wildlife species richness and diversity.”

**Management Unit G (East Wildlife Area)** occupies 493 acres encompassing nearly the entire eastern corner of the lake. It includes 348 acres of open water and an extensive emergent marsh (348 acres) that covers the northeast shore. This marsh is a monoculture of reed canarygrass. Fingers of this marsh reach into the upland area of the unit that are flooded when the lake is at high pool. This upland consists of a complex mosaic of lowland grasslands (50 acres) and upland grasslands (15 acres) interspersed with stands of deciduous (15 acres) and coniferous (20 acres) woodlands. Scattered shrubs (15 acres), primarily blackberry, are invading throughout the grassland. Vegetation on 20 acres, including the rights-of-way of the railroad and Row River Road, has been disturbed. The East Wildlife Area contains the largest contiguous area of high quality wildlife habitat at Dorena Lake and is very well suited to wildlife management activities. Large Douglas fir trees along the shoreline are used extensively as perch sites by bald eagles and other raptors which forage in the lake, including the marsh area. There is a known bald eagle nesting site on BLM land adjacent to the project. Management Objectives for the East Wildlife Area Unit include “maintain and sustain wintering and nesting waterfowl habitat,” “provide nesting and forage habitat for osprey and other raptors,” “maintain and sustain bass spawning and nursery habitat,” and “promote wildlife species richness and diversity.”

**Management Unit H (Teeter Creek)** is a low-lying 34 acre unit along the northeast shore of Dorena Lake along Teeter Creek near its mouth at Dorena Lake. This unit is leased to Lane County to operate and maintain for park and recreation purposes, but is currently unimproved and receives very light public use, mostly from hunters. The Teeter Creek Unit is vegetated primarily by a mixed deciduous-coniferous forest (principally Douglas fir and black cottonwood) growing in the riparian zone along Teeter Creek (15 acres). At slightly higher elevations on the terrace are open meadows that formerly were cultivated areas, but are now vegetated by lowland grasses suited to seasonally wet conditions (10 acres). The unit also contains many old fruit trees that were part of an old orchard. Interspersed throughout the unit are clumps of invading shrubs,

principally blackberries (4 acres), coniferous trees (2 acres), and deciduous trees (2 acres). Management objectives for the Teeter Creek Unit include to “manage habitat for constituent wildlife species, with special emphasis on maintenance of upland gamebird and cavity-nesting waterfowl habitat, forage production for black-tailed deer, and retention of raptor perch trees.”

**Management Unit I (North Shore)** comprises most of the north shoreline of the lake. It occupies 133 acres (including 8 acres of water) along 3.5 miles of shoreline. Coniferous forests, primarily second-growth Douglas fir, are the predominant vegetation type in the North Shore Unit (70 acres). Stands of deciduous trees, including some big-leaf maple and cottonwood (11 acres) shrubs (11 acres), and upland meadows (9 acres) are interspersed throughout. A reed canarygrass marsh grows in the flooded areas at the mouth of the Rat Creek embayment (3 acres). A large amount of the unit is disturbed (30 acres), consisting of rights-of-way for Row River Road and the OP&E Railroad. Management objectives for the North Shore Unit include to “promote wildlife species richness and diversity” and “stabilize shoreline to prevent erosion, maintain water quality, and allow public access.”

**Management Unit J (Harms Park)** is a small (6-acre) unit along the northeast shore of Dorena Lake at the mouth of Rat Creek. It is a long, narrow strip of project land between the OP&E railroad grade and the shoreline of Dorena Lake. Harms Park, including the Rat Creek embayment, is presently leased to Lane County for parks and recreation purposes. Facilities include a gravel parking area, with a capacity of 30 vehicles, a gravel-surfaced one-lane boat ramp which is usable only at high pool stages, a vault toilet, and a single picnic table. Harms Park supports moderate levels of boating use during the summer when the lake is at full pool. It also supports moderate day-use by fishers, swimmers, and picnickers. Harms Park is also used as lake access for clearing and disposing of drift during the spring. This unit is vegetated primarily by upland meadow (3 acres) interspersed with stands of deciduous and coniferous woodlands (1 acre each). The remaining 1 acre of the unit is disturbed. Management objectives for Harms Park include to “promote wildlife species richness and diversity” and “stabilize the shoreline to prevent continued erosion.”

**Management Unit K (Lake Area)** occupies approximately 1,750 acres at full pool. At minimum flood control pool, the surface area is approximately 500 acres, leaving an exposed barren drawdown zone mostly denuded of vegetation. However, shallows around the shoreline have thick growths of reed canarygrass with bluegrass growing along the outer fringes. In summer, the lake has high algal growth, increased temperature, and decreased dissolved oxygen. Management objectives for the Lake Area Unit include to “manage the surface area and drawdown zone to provide forage areas for bald eagles and osprey, and habitat for waterfowl and nongame species in support of wildlife management objectives for adjacent management units.”

## 8.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN

Bald eagles are the only known listed and proposed threatened or endangered wildlife and plant species documented at Dorena Lake. However, northern spotted owls and Canada lynx may occur in the broader resource area surrounding the project. Species of concern and candidate species documented at Dorena Lake include northwestern pond turtle, Howell's montia, and shaggy horkelia (*Horkelia congesta* ssp. *congesta*).

## 9. COTTAGE GROVE

This summary of USACE lands at the Dorena Lake project is based upon the *Dorena Lake Plan of Management and Development* (USACE 1989b).

### 9.1 OVERVIEW OF PROJECT LANDS

Cottage Grove Lake is located approximately 6 miles south of the city of Cottage Grove, in the south end of the Willamette Valley. It controls runoff from a 104 square mile area drained by the Coast Fork Willamette River. The Cottage Grove Lake Project contains a total of 1,547 acres, of which the Federal Government owns in fee 1,537 acres. The remaining 10 acres are flowage easements located along the Coast Fork Willamette River at the upstream end of the lake. All project lands were acquired for operational requirements, including the dam site, lake area, construction areas, road and utility relocations, and support facilities and structures. No separable lands have been acquired at Cottage Grove Lake for any other purposes, including fish and wildlife management or recreation.

Some areas the project have been outgranted to other agencies, entities, or individuals to be managed for uses consistent and compatible with authorized project purposes. The outgrants convey varying rights and responsibilities for management of project resources to the outgrantees. The outgranted lands are predominantly used for transportation and utility rights-of-way. Generally, these instruments allow the outgrantee rights to construct, use, operate, and maintain roadways or utilities crossing project lands for a variety of purposes. Lane County holds an easement for roads on each side of Cottage Grove Lake. Weyerhaeuser Corporation holds an easement for a truck-line logging road along the west side of the lake. Additional easements have been authorized to Emerald People's Utility District and California-Oregon Power Company. A small (2.5 acre) sewage-treatment irrigation field adjacent to the project sewage lagoon downstream of the dam is grazed by sheep under a lease agreement to help maintain the field and eliminate the need for periodic mowing. Plate B-22 identifies the land allocations and outgrants for the project lands at Cottage Grove Lake.

The lake and its shoreline are used for boating, swimming, picnicking, camping, fishing, and hunting (waterfowl). There are six recreation areas at the Cottage Grove Lake project. Camping is provided at the Pine Meadows Campground and Primitive Campground (totaling approximately 120 campsites). Three moderately developed day-use parks, Wilson Creek, Lakeside, and Shortridge, provide for activities such as swimming, picnicking (126 sites), fishing, and water skiing. Three boat launch lanes, 3 courtesy boat docks, and 3 swimming beaches are provided at these sites. Riverside Park is a minimally developed public access point along the river below the dam. In 1996, about 558,600 recreation visits were made to the Cottage Grove project.

Approximately 133 acres of project land are occupied by a coniferous forest, while 41 acres are deciduous forest. These two forested habitats are typically interspersed, with western red cedar and Douglas fir co-dominant, with Oregon ash and willow. Understory vegetation typically includes shrubby evergreen and Himalayan blackberry, blue elderberry, and bracken fern, while herbaceous vegetation includes pearly everlasting, St. John's wort, self-heal, poison oak, stinging nettle, Siberian miner's lettuce, willow herb, wood sorrel, daisy, buttercup, dock, and grasses. Shrubby upland vegetation comprises approximately 15 acres of project lands, while grasslands and disturbed areas comprise 93 and 96 acres, respectively. Lakeside habitat at Cottage Grove Lake also includes extensive marshlands (approximately 193 acres) including those areas around the mouths of tributary Wilson and Cedar Creeks. These marshlands areas are typified by extensive stands of reed canarygrass interspersed with common thistle, spiraea, rose, soft rush, spike rush, and sedges.

## 9.2 PROJECT-WIDE RESOURCE OBJECTIVES

The master plan identifies 15 lake-wide resource objectives that reflect the capabilities and constraints of Cottage Grove Lake's resources and specify how they should be managed to help fill current and projected public needs and desires. These objectives are detailed below:

***Project Operations:*** Continue to safely and efficiently operate and maintain Cottage Grove Lake to provide the levels of flood control and downstream flow regulation for irrigation and navigation authorized by congress.

***Boating:*** Manage Cottage Grove Lake and develop and maintain access and support facilities to help fill regional needs for a diversity of water-dependent recreation activities, particularly powerboating and waterskiing.

***Camping:*** Maintain Cottage Grove Lake's lands and facilities to help support existing and future needs for overnight camping.

**Intensive Day-Use Recreation:** Maintain existing recreation lands and facilities and develop new facilities to help meet current and projected needs for day-use recreation activities, including picnicking, swimming, sightseeing, and other activities.

**Low-Density Dispersed Recreation:** Provide opportunities and support facilities for low-density dispersed recreation activities, including hunting, fishing, birdwatching, and other activities.

**Fisheries:** In cooperation with ODFW, develop and maintain a trophy fishery for wild warmwater game fish, and continue stocking hatchery trout to provide recreational fishing opportunities and forage for wildlife.

**Special Emphasis, Threatened, and Endangered Wildlife Species:** Manage habitat to support populations of sensitive, special emphasis, threatened, and endangered species, with particular emphasis on bald eagles and osprey.

**Nongame Wildlife:** Maintain and manage wildlife habitat to promote nongame wildlife species richness and diversity.

**Upland Habitat:** Maintain and manage habitat areas to support a richness and diversity of species, including black-tailed deer, upland gamebirds, and furbearers.

**Waterfowl:** Manage habitats to maintain and sustain 20,000 annual waterfowl use days at Cottage Grove Lake, including 25 pairs of nesting Canada geese and 50 pairs of nesting ducks.

**Water Quality:** Maintain standards of water quality that protect water-contact recreation, wildlife, and fisheries.

**Threatened or Endangered Plant Species:** Maintain and protect populations of candidate plant species for Threatened or Endangered Status.

**Cultural Resources:** Protect and interpret cultural resources sites and materials.

**Land Use and Open Space:** Maintain and manage Cottage Grove Lake's scenic resources in support of state and county goals for open space and visual quality.

**Environmental Interpretation:** Promote public understanding of Cottage Grove Lake's natural environment and its relationship to the Corps of Engineers' role in water resource development.

### 9.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS

The master plan identifies the land use classification for 410 acres of project lands (Plate B-23). These designated land use classifications include project operations (90 acres), recreation (109 acres), wildlife management (133 acres), vegetation management (68 acres) and flowage easements (10 acres). The remaining lands are easements or open water. The USACE project lands at the Cottage Grove Lake Project are also divided into 11 management units (see Plate B-23).

In the master plan, each management unit is described with regard to location, access, existing site uses, adjacent land use, vegetation, wildlife, cultural resources, and limitations and hazards. Each management unit has several to numerous identified management objectives. Those management units with objectives that relate to plant and wildlife resources are described below.

**Management Unit A (Downstream)** is comprised of 90 acres at the north end of the lake, encompassing nearly all of the area downstream of the dam embankment. While this unit contains most of the operational and maintenance facilities and structures for Cottage Grove Lake, it also includes black cottonwood, native pines and willows. For this management unit, one of the objectives is to “manage habitat for constituent wildlife species, with special emphasis on maintenance of upland gamebird nesting areas, forage production for black-tailed deer, and retention of raptor perches.”

**Management Unit D (West Shore)** is a 74-acre narrow strip of land between London Road and the west shoreline of the lake. Management objectives for this unit include “provide raptor perch sites,” “promote wildlife species richness and diversity,” and “stabilize shoreline to prevent erosion.”

**Management Unit E (London)** includes the entire upper end of the lake, approximately 226 acres. Vegetation within this unit is highly variable. It includes 124 acres of emergent marsh, 33 acres of coniferous forest, 27 acres of deciduous forest, 11 acres of upland grasses, 6 acres of lowland grasses, and 1 acre of shrubs. Objectives within this management unit include “protect and develop raptor perch sites,” “promote wildlife species richness and diversity,” “stabilize eroding shorelines,” and “protect populations of unique, threatened, or endangered plant species” (*Aster vialis*, wayside aster).

**Management Unit F (Wilson Creek Park)** is a 25-acre unit on the east bank of Cottage Grove Lake. It is highly developed for intensive day-use recreation. Facilities include 50 picnic units, a swimming beach, 2 restrooms, a paved access road, parking for 37 vehicles, pump house, and 2 changing houses (now used for storage). At the south end of the park is a one-lane boat ramp with a courtesy dock and parking for 34 vehicles. Ten acres of this unit is a grove of large, old-growth Douglas fir trees, with an understory that is either managed grass or barren. Shrubs and small trees are limited to the area along Wilson Creek and at the margins of the unit. There is a narrow fringe of upland grassland (3 acres) along the shoreline where the trees have been cleared. An extensive emergent marsh consisting primarily of reed canarygrass occurs within two small embayments in the unit and offshore. The remainder of the unit (4 acres) consists of areas where vegetation was disturbed for road rights-of-way, parking, and recreational facilities. Bald eagles have been observed perching on trees in Wilson Creek Park. Objectives within this management unit include to “protect and maintain raptor perch sites.”

**Management Unit I (Sweeny Creek)** is a 38-acre site that supports a diversity of vegetation communities. It includes 7 acres of emergent marsh along the reservoir and 15 acres of

deciduous and coniferous forest on the hillsides south of Sweeny Creek and on the ridge to the east of Reservoir Road. The forested habitats are interspersed with upland meadows (5 acres) and shrubs (7 acres). Further offshore, bluegrass grows in a low mat which is exposed during drawdown. Within this management unit, one of the objectives is to “promote wildlife habitat and species richness and diversity.”

**Management Unit J (Shortridge Park)** is a 7-acre site developed for intensive day-use. Facilities include 43 picnic units, restroom, pumphouse, and parking lot with spaces for 36 vehicles. It receives moderate to intensive levels of visitor use during the summer recreation season, but is only lightly used during the remainder of the year. It is dominated by second-growth Douglas fir forest, but western red cedar, western hemlock, yew, and madrone are also present, along with some maintained turf grass. Among the management unit objectives at Shortridge Park are to “control shoreline erosion.”

**Management Unit K (Lake Area)** includes open water as well as the shallow emergent wetlands that are dominated with reed canarygrass with bluegrass along their outer margins. At full pool, Cottage Grove Lake has 1,115 acres of water surface. At minimum flood control pool (elevation 750 feet), the lake surface area is approximately 293 acres, with an exposed drawdown zone of 898 acres. Most of the lake bottom exposed during drawdown for flood control is devoid of vegetation. Eurasian milfoil is found in the meander channels of the upper lakebed. One of the management objectives in the Lake Area unit is to “monitor and control nuisance aquatic weeds.”

#### **9.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN**

The bald eagle is the only identified listed and proposed threatened or endangered wildlife and plant species documented at Cottage Grove Lake. Species of concern and candidate species documented at the project include long-eared myotis and wayside aster (*Aster vialis*).

### **10. FERN RIDGE**

This summary of USACE project lands at the Fern Ridge Lake project is based upon the *Fern Ridge Lake Plan of Management and Development* (USACE 1988).

#### **10.1 OVERVIEW OF PROJECT LANDS**

The Fern Ridge Lake project lands are very flat, with elevations ranging from 373.5 to 378 feet, and slopes generally ranging from 0 to 7 percent. The Fern Ridge Lake Project contains a total of 12,780 acres that are either owned in fee by the Federal Government, or for which flowage or

other types of easement rights have been acquired. A total of 11,810 acres are project fee-owned lands that were acquired outright for the project. Along the Long Tom River downstream of the dam, easements for channel improvements were acquired on 776 acres. The remaining 193 acres are flowage easements around the lake.

Of the total project area, 12,555 acres (including both fee and easement lands) are allocated, or were acquired for project operations requirements. These lands include the dam site, lake area, project construction areas, road system relocations, and support facilities and structures. The remaining 225 acres of project area are separable recreation lands acquired between 1964 and 1969 specifically for recreation purposes. These lands are in four parcels around the lake or within or adjacent to developed park sites. The project contains no separable lands acquired for fish and wildlife management or mitigation. Large areas of project lands have been outgranted to other agencies and organizations for uses compatible with project purposes. More than 5,000 acres, including 1,384 acres of land and 3,626 acres of water, are licensed to the ODFW which, in cooperation with the USACE, manages the area for wildlife, particularly migratory waterfowl.

Fern Ridge Lake has become an extremely popular area for swimmers, boaters, and other users, even though recreation was not originally an authorized primary project purpose. It receives heavy use for picnicking, swimming, sailing, water skiing, and fishing. In 1996, about 845,700 recreation visits were made to Fern Ridge. The USACE operates Perkins Peninsula and Kirk Parks. Orchard Point, Richardson Park, and Zumwalt Park, totaling 362 acres, are leased to Lane County for parks and recreation purposes. A total of 17 acres are leased to the Eugene Yacht Club and Tri-Pass ski Club, quasi-public organizations providing recreation facilities for members. A 7-acre parcel on Jean's Peninsula is leased to a private concessionaire who, for a fee, provides day use and camping facilities, and boat moorage. Education leases for two sites totaling 38 acres have been granted to Bethel School District and Eugene School District 4J for environmental interpretation and other educational purposes. In addition to those outgrants, permits have been granted to adjacent landowners for certain private and exclusive uses of project lands. Permitted activities include private boat docks, moorage facilities, and landscaping. There are 24 private boat docks and three community docks presently permitted along the lakeshore. Livestock watering rights have also been reserved for adjacent landowners in several areas around the lake.

Fern Ridge Lake is a wide, shallow, multi-purpose reservoir. The lake is irregularly shaped and has a large peninsula on the south shoreline between the channels of the Long Tom River and Coyote Creek. The lake and adjacent USACE lands encompass a variety of vegetative communities. The mixture of riparian forest, coniferous forest, oak woodland, emergent marsh communities (cattail, bulrush, and reed canarygrass), grasslands, shrub lands, (early to intermediate seral stage), agricultural lands, mudflat and open water habitats provide components

appropriate for many species of wildlife. The major habitat types on Fern Ridge project lands include upland grassland (373 acres), lowland grassland (943 acres), reed canarygrass marshland (2,248 acres), shrub habitats (158 acres) deciduous forest (830 acres), and coniferous forest (275 acres). Eurasian watermilfoil is found along the shores of Fern Ridge Reservoir, in the Long Tom River, and in Coyote Creek. A heavy infestation exists in Kirk Pond.

Fern Ridge Lake is located in the south end of the Willamette Valley, in the floodplain at the confluence of the Long Tom River and Coyote Creek. It is very flat, with elevations ranging from 373.5 to 378 feet, and slopes throughout most of the project generally ranging from 0 to 7 percent. The Fern Ridge Lake Project contains a total of 12,780 acres which are either owned in fee by the Federal Government or with flowage or other types of easement rights have been acquired. A total of 11,810 acres are project fee-owned lands that were acquired outright for the project. Along the Long Tom River downstream of the dam, easements for channel improvements were acquired on 776 acres. The remaining 193 acres are flowage easements around the lake.

Of the total project area, 12,555 acres (including both fee and easement lands) are allocated, or were acquired for project operations requirements. These lands include the dam site, lake area, project construction areas, road system relocations, and support facilities and structures. the remaining 225 acres of project area are separable recreation lands acquired specifically for recreation purposes between 1964 and 1969. These lands are in four parcels around the lake or within or adjacent to developed park sites. The project contains no separable lands acquired for fish and wildlife management or mitigation. Plate B-24 identifies the land allocations and outgrants for the project lands at Fern Ridge Lake.

Large areas of project lands have been outgranted to other agencies and organizations for uses compatible with project purposes. More than 5,000 acres, including 1,384 acres of land and 3,626 acres of water, are licensed to the ODFW which, in cooperation with the USACE, manages the area for wildlife, particularly migratory waterfowl.

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two sites totaling 38 acres have been granted to Bethel School District and Eugene School District 4J for environmental interpretation and other educational purposes. In addition to those outgrants, permits have been granted to adjacent landowners for certain private and exclusive uses of project lands. Permitted activities include private boat docks, moorage facilities, and landscaping. There are 24 private boat docks and three community docks presently permitted along the lakeshore. Livestock watering rights have also been reserved for adjacent landowners in several areas around the lake.

Fern Ridge Lake is a wide, shallow, multi-purpose reservoir. The lake is irregularly shaped and has a large peninsula on the south shoreline between the channels of the Long Tom River and Coyote Creek. The lake and adjacent USACE lands encompass a variety of vegetative communities (i.e., wildlife habitats). The mixture of riparian forest, coniferous forest, oak woodland, emergent marsh communities (cattail, bulrush, and reed canarygrass), grasslands, shrub lands, (early to intermediate seral stage), agricultural lands, mudflat and open water habitats provide components appropriate for many species of wildlife. Birds are the most dominant wildlife component at Fern Ridge in terms of both number of species and number of individuals. Waterfowl are one of the major species complexes. Ongoing waterfowl management actions have resulted in increases numbers of waterfowl. Shorebirds, rails, gulls, herons, bald eagles, osprey, and purple martins are dependent on large contiguous, undisturbed tracts of open water, mudflat, or emergent marsh habitat for foraging, nesting, and roosting. In addition, greater than 200 species of nongame birds have been identified. Forested tracts provide habitat for many nongame species and contribute substantially to the overall wildlife value of the project. Raptors are quite common on the project, a response to the large area, diverse habitats, and lessened disturbance on project lands relative to the surrounding areas that are well developed. Upland game birds are well represented among the project's fauna. Black-tailed deer are the principal big game resource. Descriptions of each of the major habitat types on Fern Ridge project lands follow.

**Grasslands:** The Fern Ridge Lake area contains extensive upland (373 acres) and lowland (943 acres) grassland habitat. These areas are located primarily on Gibson Island near the marshes, along the east shore of the lake, and north of Kirk Pond. Upland and wetland grasses in these areas include brome grass, fescue, bentgrass, reed canarygrass, reed grass, and a few alkali grasses. Remnants of the native Willamette Valley tufted hairgrass prairie, once a common habitat type in the Willamette Valley, exist at Fern Ridge. Most of the dominant species are native, but a variety of introduced species are present. Their dominant species include numerous brome grass, fescue, hairgrass, bentgrass, ryegrass, and other prairie species. Associated with the grasses are many forb species, some of which are presently threatened or endangered. The few tracts of grassland or meadows surrounding Fern Ridge Lake may represent the last remaining portions of this habitat, and do contain some uncommon forbs. This is especially true of wet

native lowland prairie habitat. Most of the site is open grassland, but shrubs and trees are invading due to a lack of fire in the ecosystem.

**Marshlands:** Extensive mats of reed canarygrass marshland (2,248 acres) fill shallow waters of the lake, particularly along the east shoreline and in the inlets created by the Long Tom River, Coyote Creek, Amazon Creek, and other smaller drainages. Fern Ridge Lake contains a large percentage of the total inland marshes of Lane County and, as such, is extremely important for wildlife. Patches of cattail marsh are located at the edges of the reed canarygrass. Bulrushes dominate two marshes on the west shore of the lake. The other prominent species in these marshes are spikerush, sedges, tapered rush, bird's foot trefoil, alkali grass, speedwell, self-heal, woodreed, and field mint.

Diverse shrub swamps and forested swamps characterize the Long Tom Channel and Coyote Creek between the marshland and upland forests. Snags are prominent at the mouth of the river and in several other places around the lake. Plants that surround the snags and contribute to a diverse habitat include cattail, reed canarygrass, and bulrush in open water; spiraea, wild rose, and berries on higher ground; and numerous sedges and rushes in the shallow flooded areas.

Eurasian watermilfoil (*Myriophyllum spicatum*) is a nuisance aquatic macrophyte that stands to impair navigation, reduce flow rates, increase sedimentation, and reduce habitat value. It is highly invasive, capable of out-competing other aquatic plants, and, once established, is very difficult to eradicate. Eurasian watermilfoil is found along the shores of Fern Ridge Reservoir, in the Long Tom River, and in Coyote Creek. A heavy infestation exists in Kirk Pond. These sites are likely sources for the spread and infestation of the Willamette River.

**Shrub Habitats:** Some shrub habitats (158 acres) exist primarily along the winding Long Tom River Channel and oxbow pools, and consist of dense blackberries, roses, and hawthorn thickets. In some areas, blackberries are a nuisance because of their vigor and competitive ability compared to other plants; however, they do provide a dense barrier protecting bird life, small mammals, and other species from predators and human impacts. Young fir and hardwood trees are often found in these areas, forming a structurally diverse and ecologically dynamic habitat with abundant litter forming herbs.

**Forests:** Fern Ridge Lake contains both deciduous and coniferous forest habitat types (830 acres and 275 acres, respectively). Several unusual deciduous associations occur along Coyote Creek, on Perkins Peninsula, in Kirk Park, and along the Long Tom Channel. Dense riparian growth is found along Coyote Creek; primary tree species are big-leaf maple, oak, Oregon ash, and red alder. The understory is thick with berries, forbs, and grasses. Kirk Park and the woods southwest of the Long Tom mouth contain an oak-ash association. Young Oregon white oak and Oregon ash co-dominate. Few other tree species except black cottonwood exist in the riparian zone. A mixture of herbs and grasses form the understory of these deciduous woodlands. The Fern Ridge Lake hardwood forests are also important habitats. Few other places in the upper

Willamette Valley have the same associations of climax and sub-climax species or integration with grasslands and wetlands as Kirk Park and the Long Tom and Coyote Creek channels.

## 10.2 PROJECT-WIDE RESOURCE OBJECTIVES

The master plan identifies 16 lake-wide resource objectives that reflect the capabilities and constraints of Fern Ridge Lake's resources and specify how they should be managed to help fill current and projected public needs and desires. These objectives are detailed below:

***Project Operations:*** Continue to safely and efficiently operate and maintain Fern Ridge Lake to provide the levels of flood control and downstream flow regulation for irrigation and navigation authorized by congress.

***Boating:*** Manage Fern Ridge Lake and develop and maintain access and support facilities to help fill existing and future needs for a diversity of boating and related water-dependent activities, including powerboating, water skiing, sailboating, sailboarding, and boat fishing.

***Day-Use Recreation:*** Develop and maintain project lands and facilities to help meet current and projected study area needs for day-use recreation activities, including picnicking, swimming, fishing, sightseeing, hunting, and other activities.

***Trails:*** Designate trail corridors and develop trails and support facilities to help meet future study area desires for walking and bicycling opportunities.

***Low-Density Dispersed Recreation:*** Provide opportunities for public access and support facilities for low-density, dispersed recreation activities, including hunting, fishing, birdwatching, canoeing, and other activities.

***Visual Resource and Open Space Management:*** Maintain and manage Fern Ridge Lake's scenic resources in support of state and lane county open space and visual resource management goals.

***Water Quality:*** Maintain standards of water quality that protect water-contact recreation and warmwater fisheries.

***Threatened or Endangered Plants:*** Maintain and protect populations of candidate, threatened, or endangered species and establish research natural areas to maintain viable unique valley prairie communities.

***Unique, Threatened, and Endangered Animals:*** Maintain and manage habitat supporting populations of unique, threatened, and/or endangered fish and wildlife species.

***Waterfowl:*** Manage fern ridge lake habitat to maintain and sustain a population of waterfowl at a level of 2.25 million waterfowl use days.

**Big Game Management:** Maintain and manage fern ridge lake habitat to support black-tailed deer.

**Wildlife Richness and Diversity:** Maintain and manage wildlife habitat to insure retention of species richness and diversity.

**Upland Gamebirds:** Maintain and manage habitat to promote self-sustaining populations of upland gamebirds, including ring-necked pheasants, California quail, and mourning doves.

**Fisheries:** Maintain and manage fisheries habitat to support identified target species.

**Cultural Resources:** Protect and interpret cultural resources sites and materials.

**Interpretation:** Develop a lake-wide interpretive program to promote public understanding of Fern Ridge Lake's natural environment and its relationship to the Corps of Engineers' role in development of Willamette Basin Water Resources.

### **10.3 LAND USE CLASSIFICATIONS AND MANAGEMENT UNITS**

The master plan identifies the land use classification (Table B-6) for 3,597 acres of project lands (Plate B-25). These designated land use classifications include project operations (90 acres), recreation (121 acres), environmentally sensitive areas (182 acres), recreation (299 acres), low density recreation (193 acres), inactive and/or future recreation (81 acres), wildlife management (2,721 acres), and flowage easements (164 acres). The remaining lands are easements or open water. The USACE project lands at Fern Ridge Reservoir are also divided into 19 management units (see Plate B-25). In the master plan, each management unit is described with regard to location, access, existing site uses, adjacent land uses, vegetation, wildlife, cultural resources, and limitations and hazards. The master plan also identifies the designated management unit objectives (and rationale) and specific management and development concepts for the unit. Those management units with objectives that relate to plant and wildlife resources are described below.

Table B-6: Fern Ridge Lake Project Land Use Classifications by Management Unit (acres).

Management Unit	Land Use Classification (acres)								Total Area
	Project Operations	Recreation	Environmentally Sensitive Areas	Multiple Resource Management			Water	Easements	
				Recreation (Low Density)	Wildlife Management (General)	Future Recreation			
West Shore					94		72		166
Richardson Park		166					22		188
Richardson Butte	71								71
Kirk Park				166			62		228
Orchard Point Park		49					30		79
Fern Ridge Dam	50								50
Shore Lane					44		9		53
Amazon Dike No. 2			44		194		207		445
Royal Amazon			62		445		394		901
Fisher Butte			76		519		533		1,128
Easy Coyote					390				390
West Coyote					304		165		469
South Marsh					166		159		325
Perkins Peninsula		69					18		87
Zumwalt Park						81	31		112
Fern Ridge Shores		15					2		17
Jean’s Peninsula				27	25		20	19	91
Applegate Lake Area					540		309		849
							6,191		6,191
Other Flowage Easements within Lake Boundary								145	145
Easements not within Lake Boundary								795	795
Total	121	299	182	193	2,721	81	8,224	959	12,780

**Management Unit A (West Shore)** is approximately 166 acres consisting of a narrow strip of project land along the west shoreline of the lake. This unit is primarily undeveloped and contains no public use facilities. The predominant vegetation community in the West Shore Unit is open water with submerged and/or emergent aquatic plants, occupying 72 acres along the entire shoreline. The remainder is a diverse mixture of upland vegetation types, including lowland grass (20 acres), upland grass (26 acres), coniferous trees (16 acres), deciduous trees (16 acres), managed cropland (13 acres), and disturbed areas (3 acres). This unit contains a substantial portion of the existing wetland, reedgrass/bulrush edge on the lake that provides important cover and nesting habitat for waterfowl. It also provides good habitat for nongame wildlife. Management unit objectives are to “manage habitat to maintain and sustain wildlife species richness and diversity,” “allow dispersed recreation activities, including fishing, wildlife viewing, and environmental education,” and “maintain unique and/or sensitive plant communities.”

**Management Unit B (Richardson Park)** occupies 188 acres at the northwest corner of Fern Ridge Lake. This unit is intensively developed public day-use area managed by Lane County Parks Department under a recreational lease. Facilities include parking, picnicking units and shelters, a swimming beach, a boat ramp, and a marina for seasonal boat moorage. The unit also includes two quasi-public (leased by private clubs and available for use by members) recreation areas, the Eugene Yacht Club and Tri-Pass Ski Club, located directly south of Richardson Park. These clubs are located partially on leased project lands, with facilities including seasonal boat moorage, boat ramps, a swimming beach, picnic areas, and camping units. The Richardson Park Unit is a managed park landscape. Most of the unit is grassland with 62 acres in upland grasses and 38 acres in irrigated grass turf. Another 31 acres are devoid of vegetation and contain park facilities including parking lots, swimming beaches, marina facilities, and boat ramps. There are some areas of deciduous trees (15 acres) and coniferous trees (16 acres), shrubs (2 acres), and emergent aquatic plants (2 acres). This unit includes a further 22 acres of open water. This unit provides good habitat for songbirds, upland gamebirds, and nongame wildlife adaptable to high levels of human activities. Management objectives for Richardson Park Unit include “promote wildlife species richness and diversity to provide wildlife viewing opportunities for lake visitors.”

**Management Unit C (Richardson Butte)** occupies 71 acres on the south-facing slope of Richardson Butte north of Clear Lake Road and Richardson Park. This unit is the highest ground at the lake. It is occupied by the operations and maintenance yard and office and also contains a sewage lagoon operated by Lane County. The Richardson Butte Unit is primarily vegetated by upland grasslands (40 acres) but contains some coniferous (15 acres) and deciduous (7 acres) forests. The remainder (9 acres) consists of disturbed areas in the vicinity of the operation and maintenance office and yard and along the west side of the Long Tom River. This unit provides habitat for upland gamebirds and nongame wildlife. Black-tailed deer use habitat in the unit as a travel corridor, while raptors forage in the open grass area. Management objectives in the

Richardson Butte Unit include to “maintain habitat for raptors, nongame species, and upland game birds, and promote wildlife species richness and diversity.”

**Management Unit D (Kirk Park)** is located at the northern end of Fern Ridge Lake, occupying approximately 228 acres. The majority of the unit is vegetated by deciduous trees (90 acres) along the Coyote Creek and Long Tom drainages. There are also large areas of upland grasses (47 acres) in former agricultural areas. Most of Kirk Pond and one other small borrow pit pond adjacent to it are filled with submergent aquatic plants (62 acres). There are also areas of emergent vegetation (4 acres) and woody shrubs (20 acres) around the ponds, which includes a unique species of brown flatsedge (*Cyperus melanostachys*). Most of the lands in the unit along the east side of the Long Tom River have been disturbed (6 acres). Kirk Pond has been infested by Eurasian watermilfoil (*Myriophyllum spicatum*), plus a complex of other species including *Potamogeton crispus*, *Ceratophyllum demersum*, and *Elodea canadensis*. Eurasian watermilfoil occurs throughout the pond, and in both the Long Tom River and Coyote Creek. Management objectives within the Kirk Pond Unit include “control aquatic weed problems in Kirk Pond and other water bodies in the unit,” “manage wildlife habitat for wildlife species richness and diversity and to provide wildlife viewing opportunities,” and “maintain the unique brown flatsedge community adjacent to Kirk Park.”

**Management Unit G (Shore Lane)** occupies 53 acres in a narrow band of shoreline along the northeast corner of Fern Ridge Lake. This unit is primarily used for wildlife management, with activities focussed on maintaining existing habitat for upland game and nongame wildlife. Some low-density dispersed recreation uses, including hunting (waterfowl) fishing, and bird watching occur. This unit is vegetated primarily by areas of upland grasses (27 acres) with a fringe of deciduous forest along the shoreline (19 acres). The unit also contains small areas of coniferous trees (1 acre), lowland grasses (2 acres), and woody shrubs (4 acres). There are several small covers along the shoreline which are vegetated with submerged and/or emergent aquatic plants (9 acres). Management units within the Shore Lane Unit of Fern Ridge Lake include “manage habitat to promote waterfowl, upland game, and overall species richness and diversity, and provide wildlife viewing opportunities.”

**Management Unit H (Amazon Dike No. 2)** occupies an area of 445 acres at the northeast corner of the project. Within this unit, the lake forms a shallow inlet (approximately 207 acres) which is cutoff by Amazon Dike No. 2 and is filled with submerged and/or emergent marsh and aquatic plants. The dike prevents the lake from flowing onto low-lying lands to the northeast. The unit is currently used for wildlife management with activities focussed on maintenance of existing habitat for upland game and waterfowl, but the unit supports some low-density, dispersed recreation, including hunting (waterfowl), fishing, and wildlife watching. These lands are licensed to ODFW for wildlife management. The remainder of the unit consists of upland grass (130 acres) and lowland grass (31 acres), areas formerly used for agriculture or grazing. The grasslands are interspersed by a complex mixture of deciduous (55 acres) and coniferous (17

acres) forests, managed croplands (2 acres), and woody shrubs (4 acres). The south end of this unit contains approximately 40 acres of seasonally set native lowland prairie, which supports Bradshaw's desert parsley (*Lomatium bradshawii*) and white-topped aster (*Aster curtus*). Extensive waterfowl use is associated with the marsh areas along the shoreline of this unit. Upland game birds, numerous nongame birds, and various raptors are present in this unit, and include northern harrier, black-shouldered kite, grasshopper sparrow, ring-necked pheasant, valley quail, great blue heron, green heron, and egret. Management objectives within the Amazon Dike No. 2 Unit include to "manage habitat to maintain and sustain nesting and wintering waterfowl, and upland game birds, and to promote wildlife species richness and diversity," "maintain existing unique native, wet, lowland prairie communities and the candidate endangered or threatened species within them, and designate an appropriate Research Natural Area (RNA) in coordination with the Federal RNA Program."

**Management Unit I (Royal Amazon)** occupies 901 acres along the east shoreline of the lake. The unit primarily consists of large areas of emergent aquatic vegetation (394 acres) along the shoreline and surrounding Gibson Island entire unit (including adjacent wetland areas and Gibson Island). Within the emergent plant zone are numerous small potholes of open water (3 acres). Upland areas consist of upland grasses (153 acres) fringed by lowland grasses (42 acres). Gibson Island, as well as several nearby small islands, are vegetated by upland grasses, fringed by woody shrubs (35 acres) and containing small areas of coniferous trees (7 acres) and deciduous trees (1 acre). The entire Royal Amazon Unit is licensed to ODFW for wildlife management. Water-related recreation is limited to fishing, wildlife viewing, hunting, or slow-speed boating activities. Ongoing and planned management activities focus on waterfowl habitat manipulation to create nesting habitat and to provide forage for geese. This unit has an excellent example (approximately 62 acres) of native tufted hairgrass bottomland prairie and has a healthy population of white-topped aster and Bradshaw's desert parsley. The Royal Amazon Unit is licensed to and managed by ODFW to increase nesting and wintering habitat for waterfowl. It contains diverse and abundant habitat supporting waterfowl, raptors, upland game, shorebirds, and other nongame wildlife. Deer are known to inhabit the area. Unique nongame species inhabiting the unit include purple martin, grasshopper sparrow, and black-shouldered kite in winter. Due to its inaccessibility, Gibson Island is a valuable sanctuary for birds, particularly nongame species, and provides roosting and foraging areas for hawks and owls. Management objectives for the Royal Amazon unit include to "maintain and manage habitat to support 50,000 use days by Canada geese and 250,000 use days by tundra swans, mallards, American wigeon, green-winged teal, and northern pintail, and 50 pairs of nesting mallards," "maintain unique native prairie communities and the candidate endangered or threatened species within them," "evaluate establishment of a research natural area at the tufted hairgrass valley prairie community," and "promote wildlife species richness and diversity."

**Management Unit J (Fisher Butte)** occupies 1,128 acres near the southeast corner of Fern Ridge Lake. Approximately half of the Fisher Butte Unit is managed by ODFW under a license, and is

used for a combination of intensive and passive wildlife management activities, both on land and in adjacent waters. Primary activities are focussed on waterfowl habitat management, but this unit supports a wide array of other game and nongame wildlife species. Public use of unit lands is limited due to the ongoing management activities and lack of developed public access. It does, however, support significant amounts of hunting and other seasonal, non-consumptive activities. Most public use occurs within adjacent pool areas of the lake and in Coyote Creek. The western portion of the unit consists of low marshlands along the Coyote Creek channel. The marshlands are vegetated by submerged or emergent vegetation (533 acres) interspersed with small potholes (5 acres). Above the lake pool, the unit is vegetated by upland grasses (162 acres), lowland grasses (122 acres), deciduous trees (20 acres) and woody shrubs (4 acres). Most of the remainder of the unit is managed cropland (131 acres) including water impoundments that provide winter feeding habitats for waterfowl. The site has a healthy population of Willamette daisy (*Erigeron decumbens* var. *decumbens*), the rarest and most significant plant species on the Fern Ridge complex. This unit also has a significant population of Bradshaw's desert parsley (*Lomatium bradshawii*). The site contains the best example of native grassland, with a very high quality example of tufted hairgrass (*Deschampsia caespitosa*) valley community. The Fisher Butte and adjacent units attract large numbers of waterfowl. The unit contains important habitat which supports diverse and abundant wildlife resources including waterfowl, raptors, upland game and many nongame species. Unique nongame species occurring in this unit include purple martin, yellow-headed blackbird, black-shouldered kite, and osprey. Deer also inhabit this unit. All management unit objectives for Fisher Butte apply to wildlife and plant resources. They are as follows: "In cooperation with ODFW, maintain and manage habitat to support 460,000 waterfowl use days for tundra swans, Canada geese, mallards, American wigeon, green-winged teal, and northern pintail," "maintain existing unique native prairie communities and the candidate endangered or threatened species within them, and designate an appropriate Research Natural Area (RNA) in coordination with the Federal RNA program," "promote wildlife species richness and diversity," "allow low-density, dispersed recreation focussing on opportunities for hunting, fishing, wildlife viewing, and canoeing," and "promote public awareness of wildlife management activities in this and adjacent units."

**Management Unit K (East Coyote)** occupies 390 acres at the southeast corner of Fern Ridge Lake, consisting of low and flat floodplains and stream-cut terraces along Coyote Creek, which creates its west boundary. This unit is managed by ODFW under a license and is used for a combination of intensive and passive wildlife management activities. As with other areas at Fern Ridge Lake licensed to ODFW, management activities are focussed on waterfowl habitat manipulation, including development of ponds to create nesting and foraging areas. The unit also provides habitats that support a diverse array of nongame wildlife species. The majority of the East Coyote Unit is managed cropland (280 acres) within five waterfowl impoundments which are intensively farmed and planted annually with cereal grains. There is a wooded riparian zone along the coyote Creek channel consisting primarily of deciduous trees (61 acres)

and woody shrubs (10 acres). The unit also contains some lowland grass (18 acres) and upland grass (9 acres) areas, open water (10 acres), and disturbed areas (2 acres). Unique and endangered or threatened species known to occur in East Coyote Unit are Bradshaw's desert parsley (*Lomatium bradshawii*) and timwort (*Microcala quadrangularis*). Waterfowl use the impoundments and agricultural lands for winter foraging habitat. Since those developments, waterfowl use of the unit has increased significantly. Wooded riparian zones in the lowlands along Coyote Creek provide valuable habitat for nongame species. Upland and lowland grass areas, particularly along the eastern and southern fringes, support upland game. Objectives in the Coyote Creek Management Unit include "in cooperation with ODFW, maintain and manage habitat to support 270,000 waterfowl use days for mallards, American wigeon, green-winged teal, and northern pintail," "maintain and manage existing plant communities, including marshes, grasslands, and riparian woodlands, to promote wildlife species richness and diversity, and visual and open space values," "allow low-density, dispersed recreation focussing on opportunities for hunting, fishing, wildlife viewing, and canoeing," "maintain viable communities of unique wet, native, lowland prairie and the candidate endangered or threatened plant species within them."

**Management Unit L (West Coyote)** occupies 469 acres at the south end of the lake, and consists of low, flat marshland, floodplain, and stream-cut terraces along Coyote Creek, which forms its east boundary. As with the East Coyote, Fisher Butte, and Royal Amazon units, this unit is licensed to ODFW for management focussed on waterfowl habitat. This unit contains two impoundments and associated water control devices managed by ODFW to attract and sustain wintering waterfowl. Approximately 38 acres within the impoundments are intensively farmed and annually planted with cereal grains. The unit also provides habitat that supports a diverse array of nongame wildlife species. The ODFW operations and maintenance headquarters for the Fern Ridge Management Area, including office, shop, and residence building, are located in the unit. Public use is limited to the summer and fall, but is protected the rest of the year. Most of the northern half of West Coyote Unit is vegetated with emergent aquatic plants (169 acres) and fringed by lowland grasses (57 acres). Dense riparian vegetation consisting of deciduous trees (127 acres) and woody shrubs (5 acres) grows along Coyote Creek, the east border of the unit. ODFW intensively farms 38 acres for waterfowl habitat. The remainder consists of upland grasses (73 acres). The unit includes some areas of native lowland prairie that supports Bradshaw's desert parsley (*Lomatium bradshawii*) and thin-leaved pea vine (*Lathyrus holochlorus*). Waterfowl use the marshes, impoundment, and agricultural areas for fall and winter nesting. Wooded riparian zones in the lowlands of Coyote Creek and other stream channels provide valuable habitat for deer and for nongame species. Unique nongame species include purple martin, yellow-headed blackbird, black-shouldered kite, and grasshopper sparrow. Osprey and owl nests are also located in the unit. Objectives within this management unit include "in cooperation with ODFW, maintain and manage habitat to support 160,000 waterfowl use days for mallards, American wigeon, green-winged teal, and northern pintail," maintain and manage existing plant communities, including marsh and riparian woodland, to promote wildlife

species richness and diversity, and open space and visual resource values,” “allow low-density dispersed recreation, focusing on opportunities for hunting, fishing, wildlife viewing, and canoeing,” and “maintain viable communities of unique native wet lowland prairie and the candidate endangered or threatened plant species within them.”

**Management Unit M (South Marsh)** is a 325-acre unit located on the south end of Fern Ridge Lake, and is bisected by the Highway 126 causeway. This unit encompasses inundated and upland areas along an unnamed tributary of Coyote Creek. The land and water areas of the South Marsh Unit are also licensed to ODFW for wildlife management. Wetlands and adjacent upland areas are primarily passively managed to preserve wetland habitat. Nesting boxes have been installed to increase species diversity and the unit has been fenced to prevent grazing encroachments. The unit is primarily submerged and/or emergent aquatic plants (159 acres). The fringes of the wetlands are surrounded by a combination of upland grasses (60 acres), lowland grasses (25 acres), deciduous trees (43 acres), coniferous trees (17 acres), and woody shrubs (21 acres). All of the objectives for the South Marsh Management Unit relate to habitat and wildlife protection. These are “in cooperation with ODFW, maintain and manage existing habitat to promote wildlife species richness and diversity” and “protect habitat from adverse impacts from encroachment.”

**Management Unit N (Perkins Peninsula Park)** is an 87-acre unit that forms a small peninsula on the lake’s south shoreline, directly north of Highway 126. The eastern half of this unit consists of Perkins Peninsula Park, a highly developed day-use recreation area operated by the USACE. Existing developments at the park include a boat ramp, swimming beach, picnicking area, sports playfield, horseshoe pits, trails, and interpretive displays. The developed park area contains grasses and other vegetation typical of a maintained park setting. The western half of the unit is mostly undeveloped and used for low-density recreation, particularly dispersed picnicking and wildlife viewing; passive habitat maintenance is an integral part of the recreation management of the western half of this unit. Overall, the unit is vegetated by a diverse mixture of upland grasses (9 acres), lowland grasses (5 acres), deciduous forest (29 acres), coniferous forest (24 acres), and woody shrubs (1 acre). The undeveloped western half of the unit includes areas of submerged and/or emergent aquatic plants (18 acres). Yellow-headed blackbirds, acorn woodpeckers, other nongame wildlife, and waterfowl occur in the area. Deer also frequent this unit. Wildlife species tolerant of high levels of human activities use the upland area within Perkins Peninsula Park. To “promote wildlife and plant species richness and diversity” is the only objective for this management unit that pertains to plant, habitat, and/or wildlife management.

**Management Unit O (Zumwalt Park)** occupies 112 acres on the east shoreline of Jean’s Peninsula, which separates the Long Tom drainage from the Coyote Creek drainage. This unit is a long strip of land of varying width along the shoreline. The southern half of the unit was developed to accommodate day-use recreation, but is less intensively developed than any of the

other developed park sites on the lake, with the exception of Kirk Park. This area is managed by Lane County under a parks and recreation lease. The northern half of the unit is undeveloped and used for fishing, nature study, and other low-density recreation activities. The unit consists of coniferous forests (90 acres) and deciduous forests (50 acres) mixed with lowland grass (16 acres), upland grass (30 acres), and woody shrubs (17 acres). Two small coves jutting into the unit, as well as a shoreline fringe, are vegetated by submerged and/or aquatic plants (19 acres). Bradshaw's desert parsley (*Lomatium bradshawii*) is found in the lowland prairie communities on the site, and false pimpernel (*Lindernia anagallidea*) is found in marshes and other wet habitats. The diverse vegetation communities support deer, wood duck, and many nongame wildlife species. The shoreline along much of the unit is severely eroded. Objectives for this management unit include "develop opportunities for low-density dispersed recreation focussing on trails for non-motorized activities, fishing, dispersed picnicking, and wildlife viewing," "promote wildlife and plant species richness and diversity," and "control shoreline erosion."

**Management Unit Q (Jean's Peninsula)** occupies 91 acres that consists of two parcels of land along the tip and east shoreline of Jean's Peninsula. An 8-acre parcel and the 20-acre Signal Island near the tip of the peninsula are licensed to ODFW for wildlife management. Another 15 acres south of the tip are leased to Lane County School District 4J for educational purposes. The unit also surrounds a 19-acre parcel for which the USACE has only flowage easement rights. The tip of the peninsula and several small coves along it are fringed by marshes of submerged and/or emergent grasses (20 acres). The remainder of the unit is vegetated by coniferous (38 acres) and deciduous forests (25 acres) interspersed with upland grass (5 acres), lowland grass (7 acres), and woody shrubs (2 acres). The unit provides important habitat that supports an abundant and diverse array of wildlife species, particularly birds. A bald eagle nest, is located along the west shoreline on project lands. Other unique species known to nest in the unit include purple martin, yellow-headed blackbird, wood duck, osprey, and Canada geese. All Management Unit Objectives for Jean's Peninsula apply to habitat and wildlife resources. These are as follows: "promote opportunities for nature study and other educational activities," "protect critical bald eagle nesting habitat," and "maintain and manage important bird nesting habitat and other wildlife species richness and diversity."

**Management Unit R (Applegate)** is an 849-acre low-lying, terraced flood plain located at the Fern Ridge Lake's southwest shoreline where the Long Tom River enters. The majority of this unit (807 acres, all of the unit except the former proposed Applegate Park) is licensed to ODFW for wildlife management. Management consists primarily of maintenance and protection of existing wetlands and other habitats. There is some dispersed recreation use, including hunting, horseback riding, birdwatching, and canoeing and fishing along the Long Tom River. Operation of the project for flood control requires periodic clearing of the Long Tom River and McCutcheon Ditch, which enter the lake after crossing through the unit. The Applegate Unit consists of deciduous forests (338 acres) interspersed with numerous small openings, former pastures or croplands, vegetated by upland grasses (80 acres) and lowland grasses (33 acres),

small areas of woody shrubs (22 acres), coniferous trees (35 acres), managed cropland (5 acres) and disturbed areas (4 acres). Large areas of submerged and/or aquatic vegetation (309 acres) grow on the lakeside edge. The diverse habitat of the Applegate Unit supports abundant bird life (upland gamebirds, purple martin, yellow-headed blackbird, wood duck, and Canada goose) and a variety of furbearers (mink, beaver, red fox), and deer. Four osprey nests are located in the unit and bald eagles forage along the shore. Dead trees and snags provide important habitat for cavity-nesting birds. Management objectives for the Applegate Unit include “manage and maintain wildlife habitat to retain existing species richness and diversity and to promote wildlife viewing opportunities,” “promote low-density, dispersed recreation, focussing on providing opportunities for canoeing, hiking, wildlife viewing, and fishing,” and “interpret the unit’s natural resource values.”

**Management Unit S (Lake Area)** consists of the entire open lake surface, excluding those areas previously described, the large marsh areas surrounding Gibson Island and along the ease shoreline, and the Coyote Creek and Long Tom River drainages, as they are more closely related to the adjacent land management units. The remaining lake surface area within this unit is approximately 6,191 acres. The Lake Area Unit includes those lands exposed during drawdown, below the line of emergent vegetation fringing the lake. The elevation of emergent vegetation varies with different locales, but occurs at approximately 373.5 feet, the maximum conservation pool. This lake is used primarily as a storage reservoir for flood control and for regulation of downstream flows. At full pool (elevation 373.5), Fern Ridge Lake has 9,640 acres of water surface. The lake is also one of the region’s most important resources for water-based recreation. Approximately 3,600 acres of the lake’s surface are licensed to ODFW for wildlife management. The licensed areas, as well as the remainder of the lake surface, provide an important habitat element in support of ODFW and USACE wildlife management objectives for adjacent shoreline areas (management units). At full pool, the open water areas along the fringes of the lake provide critical waterfowl brood habitat during certain periods. At low winter pool, the lake serves as a resting area for wintering and migrating waterfowl populations. The warm, shallow-water of Fern Ridge Lake provides an environment best used by warmwater fish. Elevated summer temperatures with little thermocline, low dissolved oxygen, turbidity, and water level fluctuations all contribute to unsuitable salmonid habitat. By contrast, contrarchids, (crappie, bluegill, bass, pumpkinseed), catfish, bullhead sucker, and carp appear to thrive. The Fern Ridge Lake - Long Tom River system supports a native population of cutthroat trout. This species moves out of the lake into the upper Long Tom River system in mid summer. Fern Ridge Lake supports an important year-around recreational fishery. The management unit objectives for the Lake Area include “manage Fern Ridge Lake to help fill regional needs for a diversity of water-dependent recreational activities, including power boating, water skiing, sail boating, sail boarding, and fishing,” “manage Fern Ridge Lake surface areas and drawdown zone to provide habitat for waterfowl, migratory shorebirds, and nongame wildlife in support of wildlife management objectives for adjacent management units,” and “maintain optimum

populations and distributions of fish resources to provide the greatest recreational fishing benefits and to support project wildlife objectives.”

#### **10.4 LISTED, PROPOSED, AND CANDIDATE THREATENED AND ENDANGERED SPECIES, AND SPECIES OF CONCERN**

Of all the 13 Willamette Basin projects, Fern Ridge has the greatest abundance and diversity of listed threatened and endangered plant and wildlife species, as well as those that are candidates or species of concern. The following are known to occur at Fern Ridge Lake: bald eagle, Bradshaw’s desert parsley (*Lomatium bradshawii*), white-topped aster (*Aster curtus*), Willamette daisy (*Erigeron decumbens* var. *decumbens*), Kincaid’s lupine (*Lupinus sulphureus* ssp. *kincaidii*), Fender’s blue butterfly (*Icaricia icaroides fenderi*), wayside aster (*Aster vialis*), peregrine falcon (non-breeding), northern red-legged frog, northwestern pond turtle, long-eared myotis, fringed myotis, shaggy horkelia,, Howell’s montia, little willow flycatcher (*Empidonax traillii brewsteri*), olive-sided flycatcher (*Contopus borealis*), and streaked horned lark (*Eremophila alpestris strigata*).

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